RAILROAD GAZETTE

SATURDAY, JUNE 27, 1874.

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## CATECHISM OF THE LOCOMOTIVE.

BY M. N. FORNEY, *Mechanical Engineer.*

### PART X.—(CONTINUED).

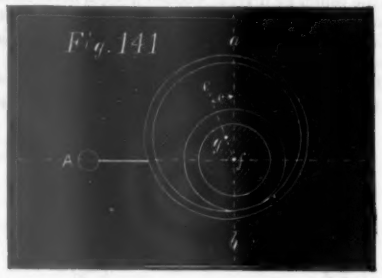
### THE VALVE GEAR.

QUESTION 224. *Which parts of the link-motion have the greatest influence on the distribution of steam?*

*Answer.* The lap of the valve and the throw of the eccentrics. The effect of any change of these upon the distribution is very similar to that produced if a single eccentric is used, which was explained in the answers to Questions 49, 50 and 51.

QUESTION 225. *What is the effect upon the admission of increasing the throw of the eccentric with the same lap?*

*Answer.* As already explained the effect is to increase the



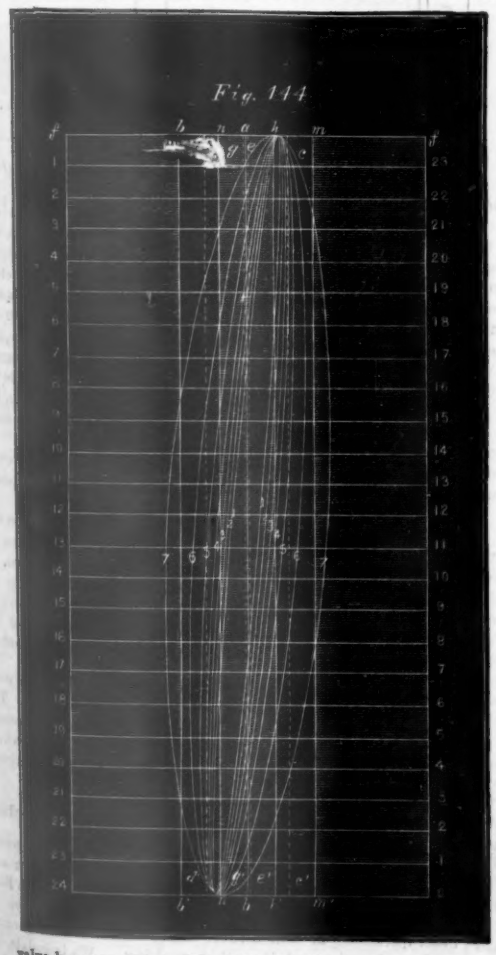

period of admission, or in other words to cut off later in the the stroke, and also to increase the middle of the opening of the steam-port or the distance which the valve throws over the port. This has an important influence upon the admission, when the link-motion is used.

QUESTION 226. *What is meant by the angular advance of the eccentrics?*

*Answer.* It is the angle which a line drawn through the center of the axle and the center of the eccentric makes with a vertical line when the crank is on one of the dead-points or centers. Thus in fig. 141 the crank *A* is represented on the front center. In order to give the valve the necessary lead the eccentric must be moved ahead of the vertical line *a b*. The angle *c* which the line *e f* (drawn through the center of *g* of the eccentric and *f* of the axle) makes with the vertical line is called the *angular advance*.

QUESTION 227. *What is meant by linear advance?*

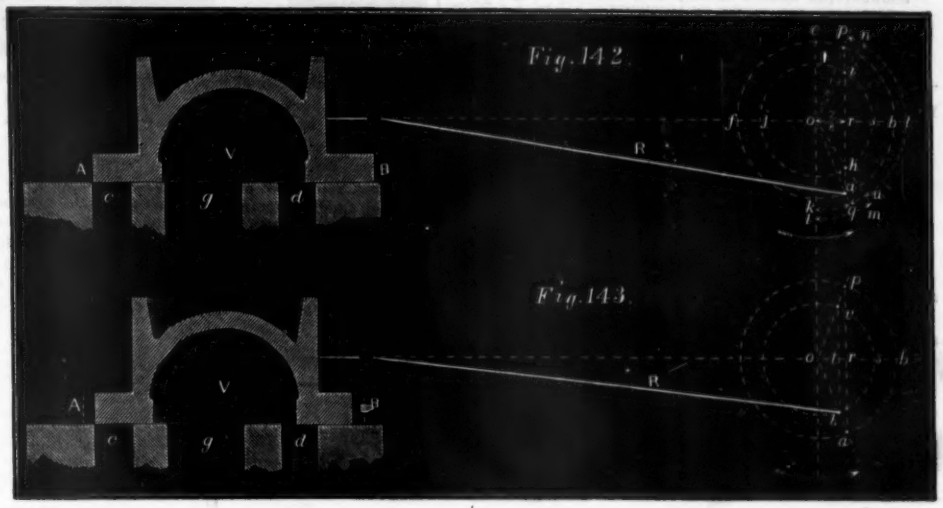
*Answer.* By linear advance it is meant the distance which the




valve has moved from its middle position at the beginning of the stroke of the piston. This is the same as the distance of the center of the eccentric *g* from the vertical line *a*, *b*, fig. 141.

QUESTION 228. *Why does the cut-off occur earlier with an eccentric having a short throw than with one which gives more travel to the valve?*

*Answer.* Because it is necessary to give the eccentric with the short throw more angular advance in order to give the valve the required lead. This is illustrated in fig. 142, in which a section of a valve, *V*, and ports *c*, *g*, and *d*, are represented. In order to simplify the diagram as much as possible the rocker is left out and the valve is supposed to be moved by the rod *R* directly from the center *a* of the eccentric. *The effect of the angularity of the connecting rod and eccentric rod is also neglected. The circle *a b e f* represents the path of the center of an eccentric having 5 in. throw and *h i j* the path of one having 3⅛ in. throw. In order to give the valve the required lead, which is supposed to be just line-and-line at the beginning of the stroke, the linear advance of the valve must be equal to the lap, or ⅜ in. If therefore we draw a line, *p a*, parallel to the vertical center line *e*, *k*, and ⅜ in. from it, the intersection of *p a* at *a* and *h* with the paths of the eccentric will be the centers of the eccentrics. If through these centers and the center of the circle lines, *o a*, and *o p*, be drawn, the angles which they make with the vertical *e k* will be the angular advance. It will be seen from these lines that in order to give the valve the required lead it is necessary to give the eccentric with the small travel more angular advance than is necessary for the one with the larger throw. It is obvious, too, that when the center of the larger eccentric has reached the point *b* the valve will have received its greatest travel, and that when it reaches *p* the steam-port *c* will again be closed or the steam cut off. If the small eccentric is employed, the valve will then have its maximum travel when the center *h* reaches *s*, and the port will be closed when it reaches *i*. By drawing lines, *o p*, and *o n*, through *i* and *p*, it will be seen that from the beginning of the stroke until the steam is cut off, if the large eccentric is employed, it, and consequently the shaft and crank, must move over an angle measured by the arc *q t p*. If the small eccentric is used, it and the crank must move through an angle measured by the arc *u t n*. In other words, the crank must turn a considerably greater distance before steam is cut off with an eccentric having a large than with one having a small throw.




It is also quite obvious from fig. 142 why the port is opened a shorter distance with a small than with a large eccentric. The distances *o s* and *o b* are equal to half the throws of the eccentrics, or 1¼ and 2½ in. The linear advance *o r* is in both cases ⅝ in., and therefore after the port begins to open the valve will be moved by the small eccentric a distance which is equal to 1¼—⅝=⅝ in., and by the large one 2½—⅝=1⅞ in.

QUESTION 229. *What is the effect on the admission of giving an eccentric with a small throw the same angular advance as one with a large throw, and then reducing the lap of the valve so that the lead will be the same in both cases?*

*Answer.* The admission and the cut-off occur at the same points of the stroke, but the ports are not open so wide. This is illustrated in fig. 143, in which the paths of two eccentrics having the same throw as those in fig. 142 are represented. The center, *a*, of the larger eccentric is represented in the same position in fig. 143 as in fig. 142. If a line is drawn from the center of the larger eccentric to that of the axle, and if the center, *h*, of the smaller eccentric is located on the intersection of this line with the circle representing its path, then the smaller eccentric will have the same angular advance, but the linear advance measured by the distance *o t* will be only ⅝ in. If the valve have the same lap as in fig. 142, its steam edges at the beginning of the stroke will occupy the position represented by the dotted lines *A*, *B*. If these edges are cut off as shown by the full lines and shading, then the valve will have the same lead as in fig. 142. It is obvious, too, that if the smaller eccentric has the same angular advance it will reach the point *v*, at which, with the reduced lap, the steam will be cut off, at the same time that the center, *a*, of the large eccentric will reach *p*, at which point it cuts off the steam with the valve having the large lap. There is, however, this difference in the distribution, that in the one case the valve opens the port a distance equal to *t s*, and in the other a distance equal to *r b*. As *o t* is equal to the linear advance of the small eccentric, or ⅝ in., and *o s* to half the throw of the eccentric, or 1¼, *b s* is equal to 1¼ — ⅝ = 1⅛ in. The distance *r b*, as shown above, is equal to 2½ — ⅞ = 1⅝ in., so that the effect produced upon the admission of using an eccentric with a small throw and corresponding amount of lap is, the ports are not opened so wide as with an eccentric having a larger throw.

*It will be seen that this causes the position of the center of the eccentric to be reversed.

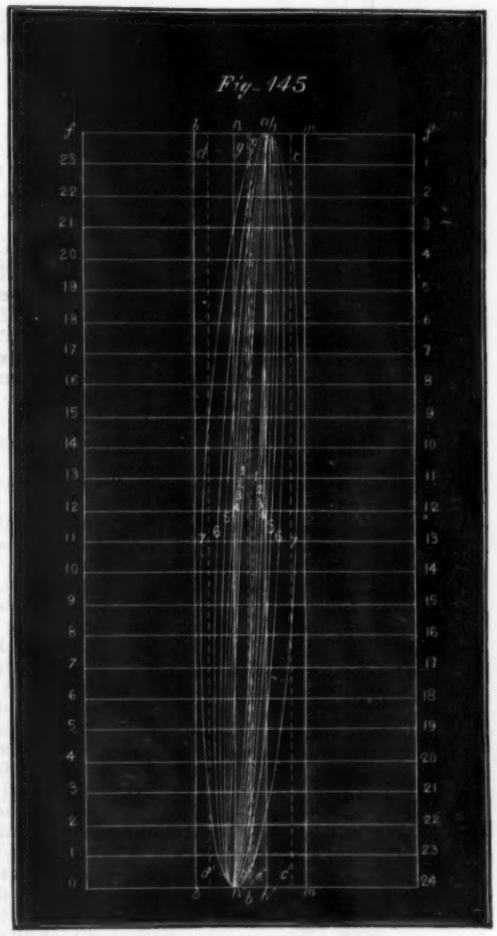
QUESTION 230. *How do eccentrics with a short throw, and valves with a corresponding amount of lap, affect the admission with a link motion as compared with eccentrics having a larger amount of throw and greater lap of valve?*

*Answer.* The chief difference is that the ports are not opened so wide for the same period of admission. Thus in fig. 144 is a series of motion-curves drawn with a model of a link motion like that illustrated in fig. 103. The eccentrics had 5 in. throw, and the valve ⅞ in. lap outside and 7-16 in. inside. Fig. 145 represents a series of curves, drawn with the same arrangement of valve-gear, excepting that the eccentrics had 3⅛ in. throw and the valve ⅜ in. lap. In both cases the curves represent the motion of the valve when cutting off at the same point of the stroke. The following table will show the relative amount of opening of the port.

It will be seen from this that the eccentric with 5 in. throw gives a greater width of opening for every point of cut-off

| Point of Cut-Off. | Width of Opening of Steam-Port. | |
|---|---|---|
| | Eccentric 5 in. throw. | Eccentric 3⅛ in. throw. |
| 6 in. | 7-32 in. | 5-32 in. |
| 8 " | 9-32 " | 3-16 " |
| 10 " | 11-32 " | 7-32 " |
| 12 " | 7-16 " | 9-32 " |
| 15 " | 5-8 " | 7-8 " |
| 18 " | 31-32 " | 11-16 " |
| 21 " | 1 1-4* " | 1 1-32 " |

* The valve throws over 1¾ in. at this point




than the one with 3⅛ in. throw. For the higher admissions this is not important, but when steam is cut off short it will be observed that the width of the opening is very small. At high speeds the small opening is a great disadvantage.

QUESTION 231.—*Has it been determined what amount of opening is required for given speeds of the piston?*

*Answer.*—Not with any degree of accuracy. It is customary to make the area of the ports about one tenth that of the piston. It is certain, however, that with steam-ports of this proportion an opening considerably less than their whole area is sufficient to maintain steam at boiler pressure in the cylinders. One of the defects of the link motion is that the opening of the port is very small when the steam is cut off short. It is best, therefore, to secure the largest practicable opening of the ports for the lower points of cut-off.

QUESTION 232.—*What are the proportions of the valves and eccentrics used in the ordinary practice in this country?*

*Answer.*—The following report made by a committee of the Master Mechanics' Association will show the proportions used on thirty-five different railroads, and is a fair indication of the common practice.

TABLE
SHOWING THE AMOUNT OF LAP, LEAD AND TRAVEL OF THE VALVES OF LOCOMOTIVES USED ON 35 OF THE RAILROADS IN THE UNITED STATES AND CANADA.

| | Outside Lap. | Inside Lap. | Travel of Valve. | Lead in full Gear. |
|---|---|---|---|---|
| | in. | in. | in | in. |
| For locomotives running express pass. trains 21 use.. | ⅝ | ⅛ | 5 | 1–10 |
| " " " " " " 6 " .. | ¾ | 1–16 | 4¾ | ⅛ |
| " " " " " " 4 " .. | 1⅛ | ⅛ | 5 | ⅛ |
| " " " accom. " " 20 " .. | ⅝ | ⅜ | 5 | 1–10 |
| " " " " " " 10 " .. | ⅝ | 1–16 | 5⅛ | 1–16 |
| " " " " " " 5 " .. | ⅝ | 3–16 | 4½ | ¼ |
| " " " heavy fr'ght " 19 " .. | ¾ | 1–16 | 5 | 1–10 |
| " " " " " " 11 " .. | ⅝ | ⅛ | 4½ | 1–16 |
| " " " " " " 5 " .. | ½ | 3–16 | 4¾ | 1–10 |

QUESTION 233. *What should be the width of the bridge between the steam and exhaust ports?*

*Answer.* It is usually made about the same thickness as the sides of the cylinder, in order to secure a good casting; but sometimes it is necessary to make it wider, in order to prevent steam from escaping from the steam-chest into the exhaust, which is apt to be the case if a valve has little lap and a long travel.

QUESTION 234. *What determines the width of the exhaust port?*

*Answer.* The throw of the valve. This will be clear if we refer to fig. 146, which represents a valve with a travel of 5⅛ in. It will be seen that when it is in the extreme position in which it is shown the width *A* of the opening of the exhaust port is very small. If this opening is contracted too much it will of course interfere with the free escape of the exhaust steam. It is therefore best to make the exhaust port so wide that with the greatest travel of the valve the width of its opening will be either quite or very nearly equal to the width of the steam-port.

QUESTION 235. *Where is the reverse lever located and how is it constructed?*

*Answer.* It is located on the *foot-board** as shown at *k' k'* plate 2. It consists of a lever, *o o*, with the fulcrum at the lower end. The *reverse-rod l' k*, which connects the lever with the vertical arm *k* of the lifting shaft, is attached above the fulcrum. Figs. 147 and 148 represent side and end views of the lever on an enlarged scale, and with some of the details attached which are omitted on Plate 2. *C, C* are two curved bars, which in this country are usually called *quadrants*, but in England are called (and more properly) *sectors*. These are placed on each side of the reverse-lever and are fastened to some portion of the engine. They have notches, *n, n, n*, cut in them to receive the *latch L*, which slides in a clamp, *H*, and holds the reverse-lever in the notches in which it is placed. This latch is operated by a *trigger*, *o*, which is grasped by the locomotive runner when he takes hold of the handle *A* of the reverse-lever. The trigger works on a pin, *E*, as a fulcrum and is attached to the latch by a rod, *r r*. When the trigger is pressed up against the handle, the latch is raised out of the notches by the rod *r r*, and is pressed into them again by the spring *s* when the trigger is released. *F* is a set-screw which presses against a gib, *G*, and is intended to keep the latch tight and prevent the reverse-lever from shaking.

* The *foot-board k' k'*, plate 2 and 3, is a platform for the locomotive runner and fireman to stand on and is located at the back end of the engine.

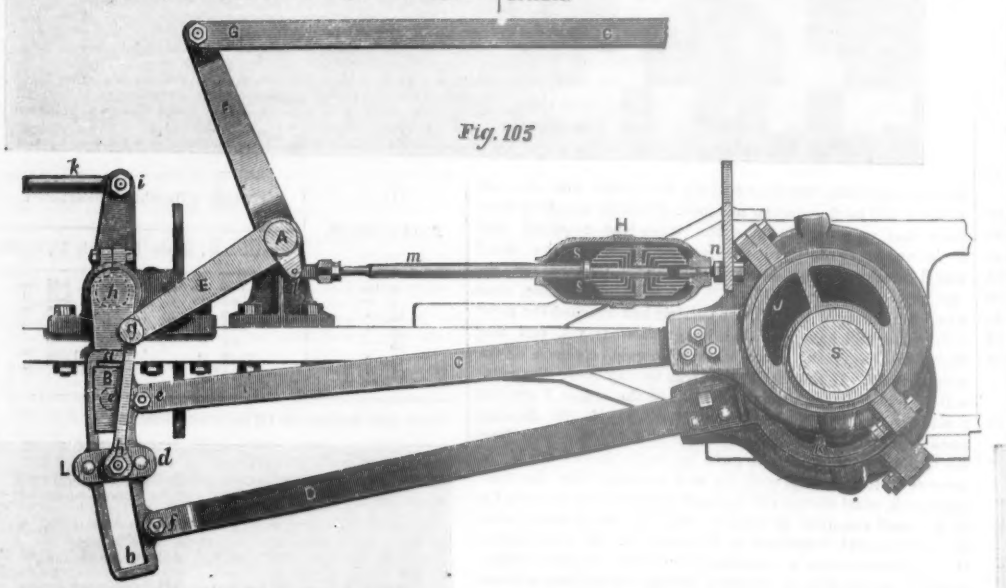


Fig. 105

QUESTION 236. *How are the notches in the sector arranged?*

*Answer.* They are usually arranged so that the steam will be cut off at any full number of inches of the stroke when the reverse-lever is in each one of them. Thus the notches are located so that the steam will be cut off at 6, 9, 12, 15, 18 and 21 inches, or at 6, 8, 10, 12, 15, 18 and 21 inches of the stroke. A notch is also placed so as to hold the link in mid-gear. In some cases as many notches as there is room for are put into the sectors. The latter seems to be much the best plan, as it gives more gradations in which the valve-gear can be worked, and it is a matter of no consequence whatever in the working of an engine whether the steam is cut off at some full or some

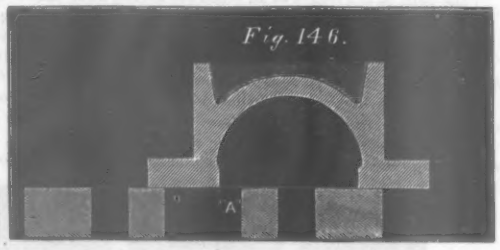


Fig. 146.

fractional number of inches of the stroke; and by referring to fig. 144 it will be seen how very great the difference of the distribution of steam must be as indicated by the 5th, 6th and 7th motion-curves.

QUESTION 237. *How long should the reverse lever be?*

*Answer.* The lever should be sufficiently long so that in throwing the link from full gear forward to full gear backward the handle *A* will move *not less* than four times the distance that the link is moved. It is much better to give the lever five or even six times the motion of the link, as there will then be a much easier action in reversing the engine. This will also make it possible to use longer sectors, and give room for more notches.

QUESTION 238. *What provision is made in the reversing gear for overcoming or neutralizing the weight of the link and other parts of the valve-gear?*

*Answer.* Their weight is counterbalanced by the pressure of a spring of some kind. In fig. 103 the two volute springs enclosed in a case, *H*, are used for this purpose. These are compressed by the rod *m*, which is attached to a short arm, *l*, on the reverse shaft *A*, when the link is lowered, and consequently the tension of the spring resists the weight of the link when the latter is down or in forward gear. Different kinds of springs are used for this purpose and sometimes are attached to the reverse-lever instead of to the lifting-shaft.

QUESTION 239. *What is meant by "setting" a slide-valve?*

*Answer.* It is to fasten the eccentrics in the right position on the axle and to adjust the length of the eccentric-rods and valve-stem so that the valves will give the required distribution of steam.

QUESTION 240. *How are the valves of a locomotive set?*

*Answer.* After the wheels, axles, main connecting-rods and valve-gear are put in their proper positions, put the rocker-arm in the middle of its throw, and lengthen or shorten the valve-stem so that the valve will be in the center of the valve-face. Then place the crank on the forward center and the full part of the forward motion eccentric above and that of the backward motion eccentric below the axle, and fasten them to the axle temporarily by tightening up the set-screws. Then throw the link down until the block comes opposite to the end of the eccentric-rod, and turn the wheels,* and at the same time observe whether the travel of the valve is equal to the throw of the eccentric, and also whether it travels equally on each side of the center of the valve-face. If its travel is greater than the throw of the eccentric, raise the link up; if less, lower it down until the two are just equal, and then mark the position for the notches on the sections or quadrants to receive the latch of the reverse-lever. If the valve does not travel equally on each side of the center of the valve-face, either lengthen or shorten the eccentric-rod as may be necessary. Repeat this operation for the backward motion, by raising the link up until the block is opposite the end of the lower eccentric-rod. After having done this, go over the whole process again to see whether it is all correct. Now with the crank on the forward center, and the link in full gear forward, loosen the set-screws in the forward eccentric, and move it around the axle so that the valve will have the required lead and then fasten it again. Now raise the link up into full back gear, and set the backward eccentric in the same way. Then turn the wheels so as to bring the crank on the back center, and observe whether the lead is correct for the back end of the cylinder. If it is not, lengthen or shorten the valve-stem or eccentric-rod so as to make the lead alike at both ends, and if it is then too much or too little, it can be increased or diminished by moving the eccentrics on the axle.

* This can be done by moving the engine on the track, or by raising it off its wheels, so that the latter can be turned without moving the former. In some shops a pair of rollers is put in the track so that by placing the driving wheels on them they can be turned without any difficulty.

Great care must be taken in setting valves to be sure that the cranks are exactly on the centers or dead points, and it is impossible to set them in that position with sufficient accuracy from the motion of the piston or cross-head, and therefore the centers of the crank-pins should always be set so as to conform to a line drawn through the center of the cylinder and the axle. When the cylinders are horizontal, it is of course only necessary to place the cranks on a horizontal line drawn through the center of the axle.

When the valves are set it should also be noticed whether the axle-boxes (whose construction will be explained hereafter) are in the center of the jaws, and if not they should be moved to the center by driving wooden wedges between them and the frames either above or below, as may be required. The position of the boxes has a very material influence on the valve-gear.

If it is intended to lay off the notches on the sectors so as to cut off steam at certain definite points of the stroke, these

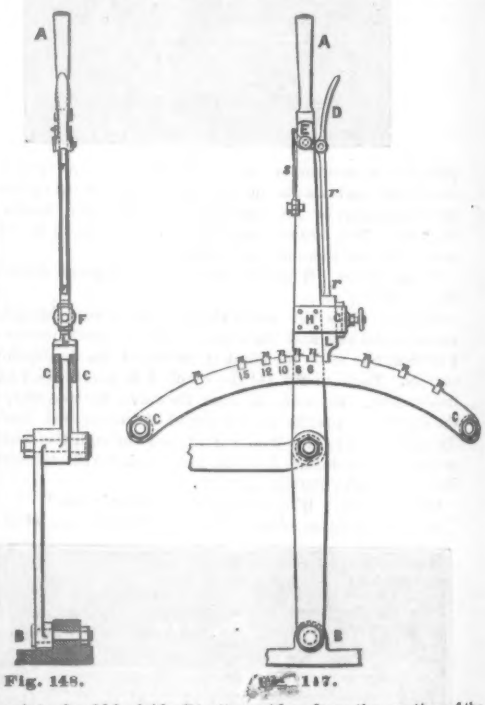


Fig. 148. Fig. 147.

points should be laid off in the guides from the motion of the cross-head. The latter being placed in any of the required positions at which steam is to be cut off, the reverse-lever should then be moved so that the link will just close the admission port. The lever can then be clamped to the sectors, and the wheels turned so as to show whether its position is correct for each end of the stroke. As before stated it is impossible to get the ordinary link-motion to cut off at exactly the same points at both ends of the cylinder, but a very close approximation can be made by proportioning the different parts properly. As has already been stated, it is believed to be a much better plan to put as many notches in the sectors as possible, than to locate them for certain definite points of the stroke.

In setting the valves of locomotives care must be taken to turn the wheels *forward* for the *forward motion* and *backward* for the *backward motion*.

After the valves are set the position of the eccentrics on the shaft should be marked, so that in case they become loose on the road they can easily be set again. It is usual, too, to mark the position of the valves with centre-punch marks on the valve-stem and on the stuffing-box of the steam-chest, so that with a gauge made for the purpose the position of the valve can be determined without taking off the steam-chest cover.

In some cases the eccentrics are keyed on, which is done after their position is determined by setting the valves. The ends of the set-screws which are used to fasten the eccentrics should be cup-shaped and case-hardened, so as to hold as securely as possible to the axle when they are screwed down.

## Questions for the German Railroad Technical Convention.

We published in our issue of May 9 the questions concerning locomotives and cars which are to be reported upon and discussed at the Technical Convention of the German Railroads which is to be held next September. Below we give the other questions, of which there are two series, one regarding road construction and the other working. We translate, as before, from the *Organ fur die Fortschritte des Eisenbahnwesens*:

A.—CONSTRUCTION OF ROAD.

1. *Bessemer Steel Rails.*—What new experience has there

been with Bessemer steel rails, especially with regard to the joints, or the substitutes for them for fastening the rails, particularly on sections with grades, or where brakes are used, and with suspension joints?

2. *Steel-headed Rails.*—Have there been any later experiments with rails having the foot of fibrous iron and a Bessemer steel head rolled on?

3. *Construction of Superstructure.*—In view of the constantly increasing speeds and loads of trains, does it seem necessary (on crowded sections of road with short curves and heavy grades) to the maintenance of a good track surface, to provide, in addition to the fish-plate connections of the rail joints and the fastening of the rails by means of hook spikes or tie bolts, still further means to prevent the sinking of the rail foot into the ties and the resulting canting and lateral bending of the rails, and likewise to prevent the lateral shifting of the rails (spreading); finally, what construction is proposed for this purpose?

4. *Cost of Maintenance with Suspension Joints.*—What has been the experience with regard to cost of maintenance when the suspension joint is used in connection with the use of the solid joint, with iron and steel rails?

5. *Breaking of Fish-plates in Suspension Joints.*—When the suspension joint is used does a heavy grade of the road (for example, 35 feet to the mile or more) favor the breaking of the fish-p ates?

6. *Iron Superstructure.*—What new experience is there in favor of a superstructure wholly iron, and what system has the most advantages?

7. *Wire-work Barriers.*—What construction of wire-work barriers answers most perfectly the demands of the road-police regulations by cheapness of first cost and simplicity of management?

8. *Crossings.*—What further experiments have been made with crossings with moveable parts; are such recommended for English switches, and if so what methods of construction?

9. *Three-throw Switches.*—What further experience has been had with switches for three tracks which makes their employment unadvisable in main tracks? (§ 65 of the Technical Regulations.)

10. *English Switches and Guide in the Center Frogs.*—What further experience has there been with regard to the use of English switches, and what improved means are employed to supply the lack of a guide in the middle crossing pieces?

11. *Heating Systems for Engine-Houses and Workshops.*—What heating system has proved best for great workshops and engine-houses?

12. *Roofing for Engine-Houses.*—What roofing has proved best for engine-houses, with regard to the durability of the fastenings?

14. *Polygonal Engine-Houses with Iron Domes.*—How have the large polygonal engine-houses covered with iron domes stood the test? Especially, do the advantages gained by these structures stand in a proper relation to their considerably greater cost, compared with annular shops with an uncovered table in front?

14. *Play between Wheel and Rail.*—With what curve on the side of the rail-head can the space between rails for the play of the wheels amount to not less than 10 and not more than 15 millimetres (0.4 to 0.6 inch)?

15. *Foundations of Correct Statistics on the Life of Rails.*—What principles are to be followed in order to obtain accurate statistics concerning the life of rails?

Experience hitherto with regard to the life of rails is of little service. The average results to be obtained from great numbers are lacking, and these are to be reached only by comparing observations made according to similar principles on the different roads.

*Reasons.*—Therefore the preparation of a uniform method of procedure for all managements is recommendable. At present the life of rails is measured according to time on some roads, and on others according to the gross load which passes over them. Besides these, the speed of the trains seems to have an important influence. What is needed, therefore, is to ascertain a proper combination of the elements coming into consideration, in accordance with which, then, uniform statistics of all German roads can be prepared.

16. *Premiums for Maintenance of Road.*—Which railroad managements have introduced a system of premiums for the work of maintaining road, and what system; and what influence has it exercised on the condition of road maintenance in comparison with the previous years?

17. *Preserving Ties.*—What further experiments have been made concerning the means of extending the life of ties?

18. *Rules for Constructing Superstructure.*—According to the present condition of experience is it practicable to decide upon generally acknowledged primary rules for railroad superstructure of broad-footed rails on oak ties, and what rules can be recommended as such for consideration?

19. *Iron Superstructure.*—What experience has been had with regard to the preservation of the iron parts of iron superstructure which lie in the ballast permanently?

20. *Joint Ties and Joint Fastenings.*—When suspension joints are used, what distance of ties from the joint and what fish-plate connection has proved best?

21. *Causes of the Breaking of Steel Rails.*—To what causes are the breakages of cast-steel rails to be ascribed; to a weakening of the rails or change in their structure during manufacture, especially by straightening them when cold?

22. *Respective Disadvantages of Running on Points of Switches and Backing Trains.*—What result do the statistics so far offer toward enabling us to weigh against each other these two dangers: Running against the points of switches and backing the trains; and finally what further collection of statistics on this matter is required?

*Reasons.*—The avoidance of entering switches by the point is of late desired more and more on the main lines. Opposed to the lessening of this danger from the switch points, however, is an increased danger of collision, both on account of the greater difficulty of switching the trains when they overtake each other, and also on account of the more difficult movement and the blockades arising therefrom.

Many train managers fear the latter danger more than the former, especially on roads with heavy traffic. The statistics have considered chiefly only the danger from running towards switch points.

23. *Profile of Frogs.*—What kind of profile on the inner side of frogs protects most effectually against the running up of the wheel flange when running against points, when the tires are much worn?

24. *Equilibrium of Adhesion and Resistance.*—Is not the requisite condition of equilibrium between adhes on and resistance on the rails exceeded more to the disadvantage of the latter, especially on railroads in hilly and mountainous districts; and what is to be done to remedy this?

*Reasons.*—Through the constantly increasing weight of the locomotives and the increased speed of some of the trains the adhesion on the rails has grown to such a degree that this question arises, chiefly for the customary superstructure with wooden ties, broad-footed rails and suspension joints.

25.—*Creeping of Rails.*—What means have proved most effective for preventing the creeping of track, without using notches?

26.—*Barrier Gates.*—Is it not generally advisable to prefer barrier gates turning on a horizontal axis to those turning on a vertical axis?

27. *Paints for Bridges.*—Comparison of experiences on the painting of iron bridges; effect, durability and maintenance of the different kinds of paint.

28. *High Wages for Labor.*—What means are adapted to work most effectively in railroad construction against the influence of the effects of wages for labor, and which have risen so materially of late years?

29. *Carrying out Railroad Projects.*—In these last years of special activity in railroad construction, what has been the experience with regard to the manner of executing the projects (letting the work as a whole, large contracts, small contracts, or construction by the company directly), and what manner of carrying them out offers the greatest security for a permanent and cheap execution of the works?

30. *Use of Aneroid in Preliminary Surveys.*—What is the experience in measuring heights with the aneroid barometer in general preliminary railroad surveys?

C.—APPARATUS FOR OPERATION.

1. *Electric Bells.*—What is the later experience with regard to the various constructions of the bell apparatus, and the employment of a constant or an interrupted current, and what combination has been approved?

2. *Portable Telegraph Apparatus.*—What is the experience with regard to the use of portable telegraph apparatus in comparison with the stationary apparatus for sections of road?

3. *Communication between Passengers and Train-men.*—What apparatus have been introduced for establishing communications between passengers and train-men for the purpose of stopping the train during the run, and what system can be recommended for adoption?

4. *Graphical Representation of the Traction Power, the Condition of the Track, the Speed, the Running Time, and the Halts.*—On what roads have apparatus with a graphical representation for measuring the traction power, for control of the running time and stops, and for ascertaining the condition of the track superseded the test stadium and come into permanent, practical use, with statement of the principles of the apparatus worthy of recommendation?

5. *Block Signals.*—What systems of block signals are in use on the railroads, and what experience has been had with regard to their reliability, and with regard to their effect on the safety and regularity of operation?

6. *Mechanical Correspondence between Switch Positions and Switch Signals.*—What apparatus have been brought into use for making the movement of trains safer at all points where collisions are liable to occur, by warning through the switches and signals, and what apparatus is to be preferred?

7. *Switch Signals.* What apparatus has been tried and is recommended for ascertaining the position of switches which are at a distance of 300 metres (1,000 feet) outside of the station yards? (§ 3 of the Regulations for Road Police.)

8. *Switching from a Central Point.*—Is the mechanical apparatus for setting the switches of a large station from a central switch tower approved, or is the electrical control of the switch and signal positions of a station in the manner of the block signals anywhere practically introduced, and what has been the experience with regard to it?

9. *Petroleum in Signals.*—What experience has been had with petroleum for illuminating the signals at switch and guard stations in place of oil?

10. *Car Covers.*—Is the use of open cars with awnings of economical advantage, in view of the costliness of the latter and their liability to damage?

11. *Works for Switching.*—Is it advisable, in view of the important extension of the switch-yards whose construction is now begun or projected in various ways, to adopt in suitable cases a system of switching or making up with transfer platforms and turn tables, and reduce somewhat the extent of ground and save time in the work of switching itself? Has there been any and what experience with making up trains by means of steam transfer platforms?

12. *Timber Trucks.*—Do you approve the carrying of wood, iron or other materials on timber trucks in such a way that the trucks are connected only by the loads and without the use of rigid couplings, and under what circumstances?

13. *Damages to Cars.*—By what measures and means can we permanently work against the excessive injuries of cars occurring of late years, especially in switching?

14. *Communication between Passengers and Train-men.*—What arrangement promises the best practical result for enabling the traveling public to communicate with the train-men during long runs of trains?

15. *Checks for Track Watchmen.*—What is the simplest method of exercising from the stations control over the track guards, in order to know that they are at their posts and not asleep?

16. *Train Barrier Signals.*—Is it advisable to make arrangements at train gates by which the engine-men will know from a distance whether the gates are closed or not, and in what way should such arrangements be made?

17. *Juedel & Co.'s Switches and Signals.*—How has the apparatus for setting switches and signals from a central point, reported to have been furnished by Max Juedel & Co., of Brunswick, for the Brunswick, the Berlin, Potsdam & Magdeburg and Magdeburg roads, been approved?

18. *Juedel's Safety Switch.*—Have experiments been made with the so-called safety switch of the same firm, and if so, what has been the result?

19. *Sliding of Loads of Rails.*—By what means can the sliding of loads of rails on cars while running be effectually prevented?

20. *Planting Slopes.*—In view of the imperfection of the spark-arresters hitherto constructed, is there any kind of plant more suitable for planting slopes, etc., than grass, which when dry is easily kindled?

## Transportation in Congress.

In the Senate, on the 17th: Mr. Pratt, of Indiana, at the instance, as he said, of Mr. B. F. Wade, Attorney of the Northern Pacific Railroad Company, called up the Senate bill to amend the act in relation to the survey of certain lands granted to the Northern Pacific Railroad. He said the charter of that road provided that a certain quantity of land on each side of the road should be conveyed to the road. Some 10,000,000 acres were due under this clause, but had been withheld by the Government on account of the clause in the Sundry Civil Appropriation bill of 1870, which required the cost of the survey to be paid by the company. This proviso was in direct contravention to the original charter, and why it was put in the Appropriation bill he was at a loss to understand.

Mr. Davis, of West Virginia, said he understood that seven or eight hundred thousand dollars were involved in this bill, and all railroads receiving public lands heretofore had paid the cost of the survey. He saw no reason why this road should be made an exception to the rule.

Mr. Howe, of Wisconsin, inquired why the bill could not be amended so as to extend the same relief to other roads.

Mr Pratt, of Indiana, said, if amended, it would probably fail on account of want of time.

The bill was then passed without amendment.

Mr. Sprague, of Rhode Island, from the Committee on Public Lands, reported without amendment the bill extending the time for the completion of a railroad in Louisiana from the Texas State line to a point on the Mississippi River opposite Vicksburg. Placed on the calendar.

The amendments of the House to the bill to authorize the Baltimore & Ohio Raiload to change the location of its track, and construct a branch road in the District of Columbia, were, on the motion of Mr. Davis, of West Virginia, concurred in, and the bill was passed.

In the House, on the 17th:

The bill reported by Committee on the District of Columbia, authorizing the Baltimore & Ohio Railroad to construct a lateral road from its Washington Branch to intersect the Metropolitan Branch of the road. Passed with amendments.

In the Senate on the 18th:

Mr. Pratt, of Indiana, introduced a bill to charter a double track freight railroad from tide water on the Atlantic to the Missouri River and to limit the rates of freight thereon. Referred to the Committee on Railroads.

Mr. Howe, of Wisconsin, from the Committee on Pacific Railroads, reported, with amendment, the House bill amendatory of the Pacific Railroad act of July 2, 1864, with an amendment in the nature of a substitute, which amendment provides that the portions of the Union Pacific and Central Pacific Railroads and their branches, upon which trains have been run during the past year, shall be accepted as completed within the meaning of the 3d section of the act of July 1, 1862, and the patents shall issue for the lands granted in aid thereof as rapidly as the surveys of the United States are extended, which surveys shall be made at the cost of the Government. The amendment further repeals that portion of the act which requires the grantees of the said lands to pay the cost of such surveys. Placed on the calendar.

In the House on the 18th:

On motion of Mr. Wells, of Missouri, the rules were suspended and the bill granting the right of way to the Arkansas Valley Railroad through the public lands in Colorado was passed.

On motion of Mr. Orr, of Iowa, the rules were suspended and the bill granting the right of way to the Nevada County Narrow-gauge Railway was passed.

In the Senate on the 19th:

Mr. Sargent, of California, called up the House bill granting the right of way through public lands to the Nevada County Narrow-gauge Railroad. Passed.

In the Senate on the 20th:

Mr. West, of Louisiana, from the Transportation Committee, submitted an amendment to the River and Harbor Appropriation bill, providing for a board of five engineers, to be appointed by the President, to make a survey of the mouth of the Mississippi River, with a view to determine the best method of obtaining and maintaining a depth of water sufficient for the purposes of commerce either by a canal from said river to the waters of the Gulf or by deepening one or more of the natural outlets of the said river. Agreed to.

On motion of Mr. Windom, the appropriation for improving the Mississippi above the Falls of St. Anthony and the falls themselves was increased from $50,000 to $200,000, of which $25,000 must be expended on the river above the falls.

Mr. Windom submitted an amendment to the River and Harbor bill, appropriating $200,000 for surveys and estimates for the improvements recommended by the Senate Select Committee on Transportation, upon the four routes indicated in the report of the said committee, and also upon a route from the mouth of the Youghiogheny River, to continue the slack-water navigation up said river, to its head waters at the foot of the Allegheny Mountains; thence by canal to the Cumberland, intersecting there the Chesapeake & Ohio Canal. Agreed to. Yeas, 28; nays, 12.

In the House on the 20th:

The Senate amendment to the House bill for the collection of the 5 per cent. of net profits of the Pacific railroad companies was concurred in.

The Senate bill for the incorporation and regulation of railroad companies in the territories was referred to the Committee on Public Lands.

The Senate bill to extend the act of March 3, 1873, for the extension of time to the St. Paul & Pacific Railroad Company for the completion of its road was concurred in.

In the House on the 23d:

The Senate bill extending the right of way to the Allegheny Valley Railroad through the arsenal grounds at Pittsburgh was taken up and passed.

The Senate bill in regard to the survey of the lands of the Northern Pacific Railroad Company was referred to the Committee on Public Lands.

This being the last day of the session, this record is closed.

The following includes the titles of all the bills passed during the session referring directly to railroads and transportation, except such as may have been passed in the closing hours:

Extending the time for the completion of the Green Bay & Sturgeon Bay & Lake Michigan Ship Canal in Wisconsin.

To extend the time for the completion of the Wisconsin Central Railroad.

To forfeit to the United States certain lands granted to the Placerville & Sacramento Valley Railroad Company to aid in constructing a railroad from Folsom to Placerville.

To amend an act to regulate the carriage of passengers in steamships and other vessels, approved March 3, 1855.

To authorise the County Commissioners of Thurston County, W. T., to issue bonds for the purpose of constructing a railroad from Budd's Inlet, Puget Sound, to intersect the Northern Pacific Railroad near Tenino.

To legalize and establish a pontoon railroad bridge across the Mississippi at Prairie du Chien, Wis., and at Clinton, Iowa.

To forfeit certain public lands granted to the Stockton & Copperopolis Railroad in the State of California.

To authorize the Baltimore & Ohio Railroad Company to construct a branch and to change the location of its road within the District of Columbia, and for other purposes.

## Railroad Manufactures.

The Baltimore Bridge Company has recently finished a bridge over the Passaic River for the Erie Railway, and one new span for the Havre de Grace bridge over the Susquehanna. It is at work on a four-span bridge over the James River at Lynchburg, Va., for the Washington City, Virginia Midland & Great Southern, and a double-track bridge for the Baltimore, Pittsburgh & Chicago at Tiffin, O.

The Barney & Smith Manufacturing Company at Dayton, O., is building six coaches for the Pullman Palace Car Company, two parlor cars for the Indianapolis, Cincinnati & Lafayette, and several passenger cars for the Indiana & Illinois Central.

The Roane Iron Company's rolling mill at Chattanooga, Tenn., is running full time. The Vulcan Rolling Mill is still closed.

The National Locomotive Works of Dawson & Bailey at Connellsville, Pa., have recently received orders for 12 locomotives.

The new car shops of the Allegheny Car and Transportation Company at Swissvale, Pa., were destroyed by fire June 10. The shops had not long been completed, and work in them was only commenced April 1. The shops cost $20,000, the machinery $25,000, and there were destroyed besides 15 unfinished cars and a large quantity of lumber.

The Brady's Bend Iron Works at Brady's Bend, Pa., were sold recently at Sheriff's sale to Col. W. D. Slack, of Pittsburgh, for $97,000.

Webster & Marks recently completed, in their shops at Chattanooga, Tenn., a passenger engine of 3 feet gauge for the Louisville, Harrod's Creek & Westport road in Kentucky.

—Mr. Carlos Dutton, formerly Superintendent of the Rome, Watertown & Ogdensburg Railroad, died at his residence in Rochester, N. Y., recently, at the age of 66 years.

—The Illinois Republican State Convention has nominated as its candidate for State Treasurer Mr. Thomas S. Ridgeway, of Shawneetown, President of the Springfield & Illinois Southeastern Railway Company, from its beginning till now.

RAILROAD GAZETTE

Published Every Saturday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

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## Editorial Announcements.

**Addresses.**—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

**Contributions.**—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

**Advertisements.**—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

## THE LOUISVILLE & NASHVILLE RAILROAD AND ITS REPORT.

The Louisville & Nashville Railroad Company publishes, we believe, without exception the most elaborate report of operations which comes to the light in America—surpassed in elaboration, so far as we know, only by some of the European government reports. The report is evidently prepared so as to serve for the thorough study of the traffic of the company, giving information which most other companies keep to themselves, if they collect it at all. It seems to us a most valuable document, serving better for the study of the general question of transportation than any other, owing to the variety and number of the facts given. But these very things, which give the value of the work for study, make it difficult to comprehend by a rapid reading, or to analyze with anything like completeness.

The Louisville & Nashville belongs to a limited class of roads, and is, take it altogether, doubtless the most important of its class, which is composed of those lines which unite the distinctively Southern States—those whose products, and especially exports, are almost exclusively Southern—with the food-producing and manufacturing Northern States. To this class belong the Richmond, Fredericksburg & Potomac, and the Washington City, Virginia Midland & Great Southern in the East, the line formed by the St. Louis & Iron Mountain and the Nashville, Chattanooga & St. Louis, the new St. Louis & Southeastern, the Mississippi Central, and, west of the Mississippi, the late Cairo & Fulton, now part of the consolidated St. Louis, Iron Mountain & Southern, and, in the Far West, the Missouri, Kansas & Texas. These roads, with the Atlantic seaboard and the Mississippi River, form almost all the routes of communication between the North and the South. In so far as they are through routes their business consists chiefly of the interchange of Northern and Southern products. Unlike the great roads of the North and South alike, they carry comparatively little produce towards the seaboard for export: Northern produce does not go to the Gulf or the South Atlantic to find vessels, and Southern produce has sea ports nearer by, and if it seeks a vessel in a Northern port finds its way thither either by sea or perhaps by one of the Virginia roads. The cotton carried north by the roads across Kentucky (and the Virginia roads as well, we believe) is chiefly for domestic consumption. The flour, corn, hay, provisions, and merchandise which they carry to the South are almost wholly consumed there. These roads therefore may be said to be almost excluded from foreign traffic. Some of them, like the Louisville & Nashville itself, have lines so far south, however, as to be properly considered Southern lines with a proper Southern traffic of cotton towards the sea-board or Eastern market, while what we have said has reference particularly to those roads or parts of roads which are properly "border" railroads—which serve to unite the Southern with the Northern lines.

Now as the number of these roads is not great and they thus serve to unite two great sections of our country with differing products, it might be supposed that these would be great traffic routes. Indeed, it has been laid down as a principle by some economists that such routes are necessarily on meridians, since products vary with the climates and the climates with the parallels, and commerce consists in the exchange of different products. But the existing facts prove the contrary. The great traffic routes follow parallels and not meridians, and the latter are the paths only of a smaller and subordinate commerce. Without attempting to give the reason of this for the world generally, for the United States we may say that the prevailing course of traffic is determined by the fact that the consumers of our exports are almost wholly to the east of us; that our own consuming district of raw products is in the extreme eastern part of our territory; that the North consumes the products of our South only after an elaborate manufacture almost wholly conducted in the East; and that the South, having altogether a comparatively small population and a wealth smaller in proportion, produces, though imperfectly, a large proportion of the heavier products of the North in quantity sufficient to cover most of its wants. That is, the South, while raising Southern produce exclusively for export, raises largely Northern produce for consumption. It sells cotton and tobacco to the North and to Europe, but at the same time has an enormous acreage in corn, which is the staple food of its men and animals, and an uncultivated area several times as large as its plow land which serves as scanty pasture for the hogs and cattle which yield its people a very large share of their meat. The North therefore sends the South, besides merchandise, a portion only of its food and forage and draught animals. The traffic from the South is, however, much smaller in bulk than in value, as agricultural products &c., so that the comparatively small proportion of its supplies which that section receives from the North vastly outweighs the cotton and tobacco which it sends there. So with only nine roads uniting the South with the North over a space of fifteen hundred miles, none has or at present needs a double track, while the most productive line, fed by a great system of branches which receive most of the traffic of a great State, produces about $15,000 a year per mile.

The through traffic between the South and the North being thus not very large, the traffic of the border railroads, which are in fact "great trunk lines," inasmuch as they serve to unite the railroad systems of two sections of the country just as truly as do the Fort Wayne, the Lake Shore and the Michigan Central, does not nearly equal in bulk that of above-named lines. One or two border roads, however, have a really large through traffic secured to them by the fact that they occupy passes, as it were, with no competitor on either hand for a hundred miles, and a system of feeders at either end of a comparatively short line (like the line from Nashville to Chattanooga); but generally the prosperity of the roads depends largely on the prosperity of the country alongside as well as that beyond them.

The Louisville & Nashville, while owning two of the best through lines south of the Ohio (Louisville to Nashville and Louisville to Memphis) is more than any other Southern railroad property, except the Central of Georgia, a system of roads, after the example so common in the North. With one line extending southward from Louisville through Nashville and Decatur to the heart of Alabama, at Montgomery, and another southwestward to Memphis, it works in addition four branches varying from 10 to 110 miles in length, and, with the main lines, occupying a large part of the most productive part of Kentucky, one of them extending pretty well to the eastern border of the productive district of that State. So while its main lines give desirable routes for traffic from Alabama and the States west of it to the North and East, and from the same and the Southern States east of it to the Northwest, its branches collect and pour upon the main line a large proportion of the traffic of a State. While two of its lines serve to gauge the traffic between the South and North, the system as a whole is a pretty fair indication of the prosperity of Kentucky.

This variety in the property adds greatly to the bulk of the report, for the detailed figures concerning the operations are given separately for each line worked, so that each of the parts as well as the property as a whole may be studied.

The whole mileage owned by this company is 605.75, which with its rolling stock and that used on 132 miles of leased lines has cost nearly $23,000,000 or $37,850 per mile. It has other property (including $3,500,000 of South & North Alabama bonds) which has cost it about $2,600,000. This whole property is represented by

| | |
|---|---|
| Stocks ($14,827 per mile) | $8,981,439 |
| Bonds ($24,466 per mile) | 14,820,500 |
| Total ($39,293 per mile) | $23,801,939 |

which is nearly $1,800,000 less than its cost. Of the bonds, $849,000 are issues of the city of Louisville which are not a mortgage upon the road.

Of the bonded debt $10,830,000 bears 7 per cent. and the rest 6 per cent. interest, and the total annual interest charge is $997,580, which is at the unusually low rate of $1,647 per mile of the road owned. As the gross earnings for the year reported (ending with June, 1873,) were $8,105 and the net earnings $2,330 per mile of road, there is seen to be such margin as makes these bonds a solid security, for which they enjoy a reputation indeed. The balance, however, was sufficient only for a dividend of a little less than 6 per cent. on the whole amount of capital stock outstanding at the close of the year. Seven per cent. was paid in dividends, but the amount of stock was considerably increased during the year.

The company also virtually controls the South & North Alabama Railroad, from Decatur south to Montgomery, Ala., which with the leased Nashville & Decatur Railroad gives it an independent line to the South. This road, recently completed, is not expected to yield an income at first, but may eventually be remarkably productive, as the country on its line is rich in coal and iron ore, and iron can be made there cheaper perhaps than anywhere else in the country.

To return to the peculiarities of the report. That of the Vice-President and General Superintendent, Mr. Albert Fink, after giving the length of the different lines worked, the gross earnings and expenditures of the total owned and of each leased, proceeds to an "Analysis of the Business of the Year 1872–73." Under this head first comes a table with columns for increase and for decrease of each separate item on each separate line worked, (Main Stem, Bardstown Branch, Knoxville Branch, Richmond Branch, and Memphis Line), and columns for the total increase and decrease of each line's earnings. Next is a statement of "Through Freight Business," which gives first the through freight earnings for two years, distributed into four classes, viz.: from Louisville to Nashville; from Nashville to Louisville; from Louisville to junction points on Memphis Line; from junction points on Memphis Line to Louisville. This statement, by the way, shows that the through freight earnings for the year were about 62 per cent. of the total freight earnings. Then follow tables of tonnage shipped from Louisville, Cincinnati, Eastern seaboard cities, and other points north of the Ohio River to Nashville proper, points beyond by Green Line, do. by other lines, to Nashville & Decatur and South & North Alabama roads and to local points on those roads, followed by a table of revenue from the shipments; then the reverse tables, that is for tonnage and revenue from the latter points or roads to the former, followed by a comparison with the preceding year. These tables account for the Main Stem through traffic, and a similar set follows for the Memphis line giving the same information for shipments from the four points first mentioned to no less than thirteen points on or beyond this line, and from these thirteen southern to the four northern points. Another set gives similar facts for the Nashville & Decatur and South & North Alabama traffic, in which under revenue the proportion coming to the Louisville & Nashville is given separately. These tables make possible a minute study of every branch of the through traffic and the revenue from it and its fluctuations, and ought to be very suggestive to those who have charge of the cultivation of such traffic. Thirty-one tables, covering 104 pages of the report, fortify the statements of the General Superintendent. Some of these are condensed for his use, among which is one (condensed table) showing the quantity of each of forty-two different articles shipped on each line and on the whole system for the year reported and the previous year. The tables proper give this information for each station. Other condensed tables give the quantity of each of these articles shipped from and to Louisville by each of these lines. The passenger traffic is analyzed with similar elaboration, after which there is a general consideration of the local business.

"Revenue and Operating Expenses and General Results" first deals with the whole system owned, giving such items as train mileage, earnings and expenses per train-mile, earnings and expenses per mile, passenger and tonnage mileage and average receipt per mile, freight-car mileage, etc. Then these figures are given also for each of the five lines, with the further account of the earnings on the Main Stem from traffic contributed by the branch. Some of these figures, making a very interesting collection for comparison, are given in the short abstract of the report published in the paper.

The elaboration of the accounts under the head of "Expenditures" is also very great, here the expenses being given for a series of years. There is also a minute statement of

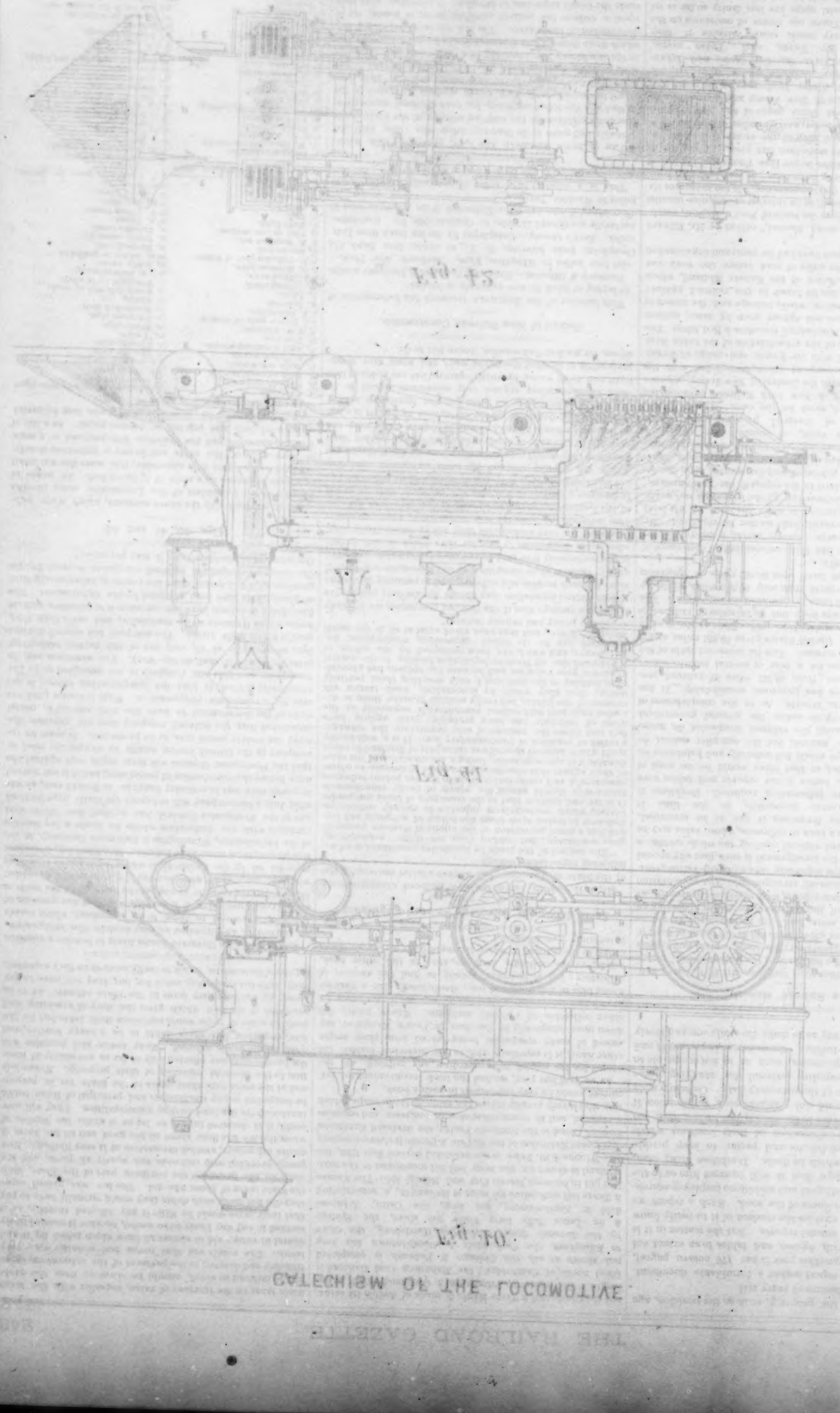


*Fig. 40.*

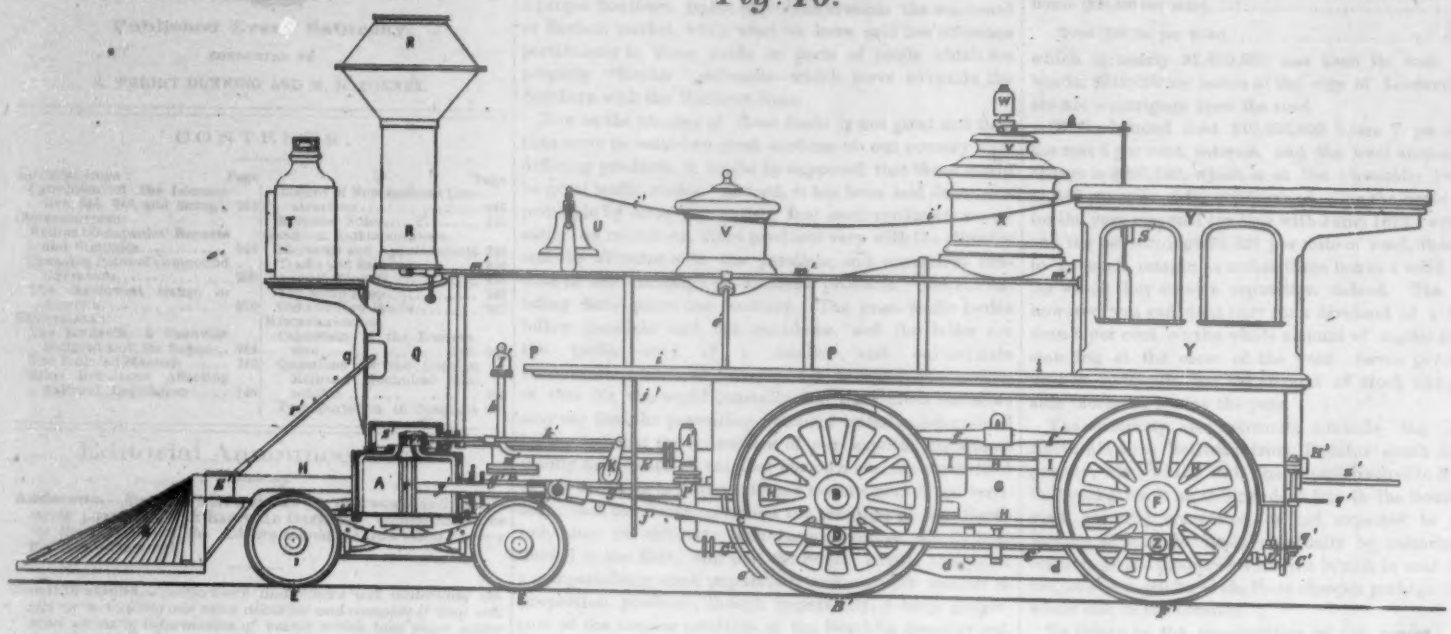


*Fig. 41.*

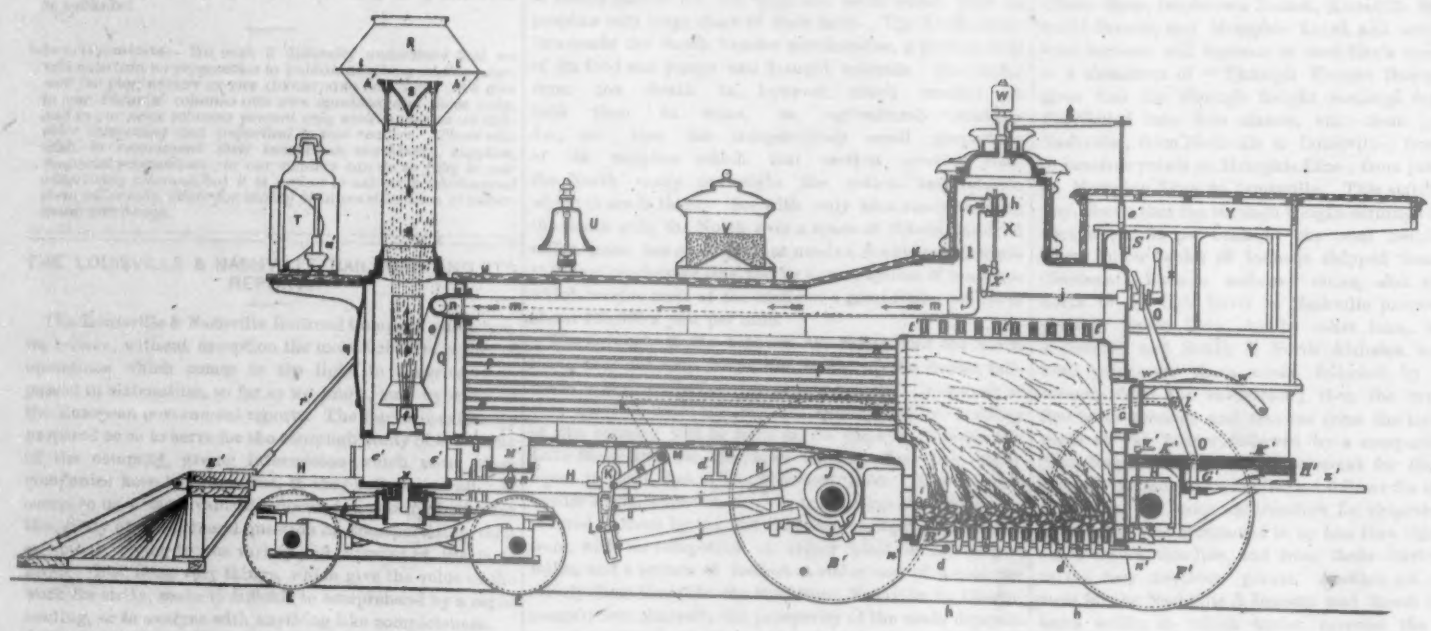
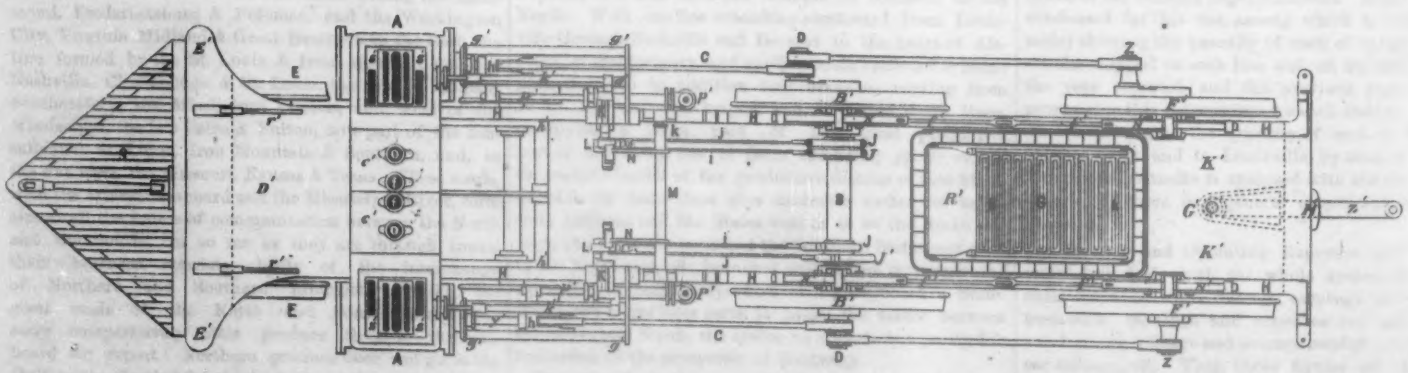


*Fig. 42.*



Geo. Schlegel, lith. 97 Wilson Street N. Y.

the condition of the property, such as the position, age and place of manufacture of every rail.

Of course such a report makes a formidable document. It is not simply large (this year it has 176 octavo pages), but it bristles with figures and tables to an extent not common even in annual reports. But the matter in it is information which enables the student of it to really know something of the business of the road. Such a report we can imagine an intelligent and ambitious employee searching with some hope that it will instruct him as to the special traffic with which he deals. Doubtless many companies object to such fulness and prefer to keep private much of the special information of their business which this company publishes to the world; but we fear that too many of them could not publish such information if they would, for lack of the necessary data. Certainly such a published report supplies material for studying some questions of transportation such as is not accessible to most men. And, further, the material is presented and analyzed in such a way as to make the study comparatively an easy one.

## The Railroad Manuals.

About a month earlier than last year, Mr. H. V. Poor's well-known "Manual of the Railroads of the United States" makes its appearance. It appears very like itself, a plain, solid, thick octavo volume, but has grown from 794 to 878 pages of text, in a clearer type of the same font. Its arrangement is, too, as before, the accounts of the different companies appearing in the order in which their reports were received apparently—at least without any systematic arrangement. The presentation of the facts and figures regarding each company varies greatly, but almost always the arrangement is such that any special fact may be easily found without reading the whole article—a prime requirement in a book of reference, whose value may be in proportion to the frequency it has to be consulted, but rather in inverse proportion to the time it takes to look up the information required. Doubtless it would be very much better if the reports and tables were made after one model, so that there would be no need of searching, but the eye would fall naturally and habitually on the particular figure wanted; but the compiler cannot do much towards this until the railroad companies do more, which they will hardly do unless the general government should require uniform reports. As to the completeness of the work, it doubtless has improved considerably. It has reports of earnings, etc., from 66,237 miles of railroad, presumably all in operation for a year or several months before the publication of the manual. Now its corrected table of the total mileage in the United States gives 70,651 miles, and it reports 3,916 miles completed in 1873. Thus at the close of the year there could have been but 66,735 miles of railroad in the country which had been in operation an entire year. The year previous it had reports from only 57,323 miles, while, by its figures, there must have been 60,600 miles in operation throughout the year 1872.

A work of reference like this—substantially a dictionary of condensed railroad reports—however useful, is not very entertaining reading, and presents little matter for comment. Mr. Poor, however, has contrived to make the issue of his book generally and highly interesting by the collection and analysis of the figures contained in the report in the "introduction," part of which we have published and commented upon heretofore. This introduction is, in fact, the only basis existing for the understanding of United States railroads as a whole. Errors exist, of course, as with such an immense mass of material prepared and issued within a limited period, must be the case. We see, for instance, that the Newark & New York Railroad, consolidated more than a year ago with the Central of New Jersey, appears still as an independent company (though included with the Central's returns), and with its length and gauge incorrect. No cognizance is taken of the consolidation of the Little Rock & Pine Bluffs with the Mississippi, Ouachita & Red River. The Rio Grande Railroad does not appear even by name, neither does the Virginia & Truckee, whose mileage and the names of some of whose officers can be found in the railroad guides: neither is there any mention of the Kansas Midland, which had completed thirty-five miles of road before the work was issued, and should at least have had its name and organization given.

The "American Railroad Manual," edited by Mr. Edward Vernon, follows close upon the heels of Poor's Manual, reaching us the next day, indeed, at an interval of only nine months since its previous (and first) appearance. It too preserves its appearance and apparently its nature. A very beautiful book it is, with pages three-fifths larger than Poor's and 114 less of them (764), and about 80 more than last year. It has, too, a neat lithographic railroad map of the entire United States, folded in a pocket in the cover, and a number of special maps stitched in—one of about three pages of the New England States and New York, one of New Jersey and Pennsylvania, with a large part of the States bordering on the north and south, one of the South Atlantic States from Virginia to South Carolina, two form the Gulf States and Arkansas, with a third for Texas, etc. These maps, however, would be very much more valuable if they were more complete. There are scores of omissions on the general map. The special maps are less faulty so far as we have examined them; but it is certainly a serious fault in a map of Arkansas to leave off entirely the Little Rock, Pine Bluffs & New Orleans, and the Mississippi, Ouachita & Red River, and show the Cairo & Fulton with 80 miles at the southwest end uncompleted, and so important a line as the Baltimore, Pittsburgh & Chicago should not be left out. Not half of the length of the Cincinnati, Wabash & Michigan is given, but the Cincinnati & Terre Haute is made of double its actual length. The Marietta, Pittsburgh & Cleveland is left unfinished north of Cambridge; the Mahoning Coal Railroad is not shown at all, the Chicago & Paducah is completed to Effingham, the Carbondale & Shawneetown too long by the distance from Marion to Harrisburg, the Cairo & St. Louis fully forty miles too short, the Springfield & Northwestern too long, the Cairo, Arkansas & Texas left unfinished for most of its length, a non-existing line put in between Macon City and Edina, Mo. The Kansas Midland is shown on the map but not mentioned in the text. The Winona & St. Peter is not extended beyond New Ulm, the St. Vincent Extension of the St. Paul & Pacific is shown complete from St. Cloud to the Northern Pacific, the Brainard Extension completed, and there are other sins of omission and commission which very greatly injure the value of these maps, which correct would be very convenient in such a book.

As we said last year, we find the book inconvenient for reference for any special fact regarding any railroad. On the other hand, it is especially rich in its historical matter, the record of many companies being traced from their origin down more completely by far than in Poor's Manual or any other collection of railroad statistics. Where pretty full knowledge concerning a company is wanted, it can often be found best in this book and read continuously like a chapter of history; but it is easier usually to find the amount of bonds, stocks, mileage, earnings, etc., in the other book, owing to the manner in which the material is arranged. Each is certainly very valuable.

## Some Influences Affecting Railroad Legislation.

Mr. J. H. Osborn, one of the new Railroad Commissioners of the State of Wisconsin, has written a letter containing the following remarkable passage:

"The control of the roads by legislative enactment is a foregone conclusion; but control does not mean 'confiscation,' and it is a gross perversion of the intent of Western people to endeavor to fasten upon them the odium of adopting any legislation which contemplates injustice to railway companies. It is my own opinion that to the managers of these companies themselves should attach the odium of really objectionable enactments, as I verily believe it is to the yet potent influence of their agents that enactments are made to assume as objectionable a shape as possible, being a manifestation of the same spirit which induced the railway managers of England to adopt a series of evasions of Parliamentary law. It is a well-known fact that where the passage of acts regulating the management of railroads has been probable, their agents have loaded such acts with radical amendments ostensibly in the interest of the public, but really seeking to make them so arbitrary that they would be inoperative. Such tactics will avail nothing in the end, and I only mention them partially to answer your remarks, and because the opinion has generally obtained that all Western legislation looking to the control of railways, and which has been promoted by the action of producers, has for its object 'oppression, confiscation,' &c. This is all fiction, and that such views exist at all is the result of railway policy and railway tactics."

It seems strange that if the railroad companies are virtually able to control legislation they should dictate laws which give them so much trouble and expense, and so seriously injure the market value of their securities, as the Wisconsin act. But it is unquestionably true that an unreasoning popular prejudice often leads legislators to vote for laws which cannot be executed for the very reason that they will be substantially void. This certainly has been the case in one State, where members of the Legislature were free to confess that they were not able to fix upon a restrictive law with any certainty that it would not be unjust, that yet they felt compelled to do something to satisfy the popular demand for such legislation, and that therefore they would vote preferably for one which the courts would be pretty sure to declare unconstitutional rather than for one which would be valid as well as unjust. This may not indicate a high degree of virtue in legislators, but it is a not uncommon phenomenon in most popular legislative assemblies, whose members are not only sometimes forced to do right and to do wrong by public opinion, but are seduced into pretending to do what the public want, and what they themselves, for good or bad reasons, desire not to do.

## Record of New Railroad Construction.

This number of the RAILROAD GAZETTE has information of the laying of track on new railroads as follows:

*Duxbury & Cohasset.*—Extended from South Duxbury southwest four miles to Kingston, Mass. *Northern New York.*—Completed from Antwerp, N. Y., to Dixon Iron Bank, 1½ miles. *Berk's County.*—Completed by laying track from Lenhartsville northward 14 miles to Germanville, Pa. *Galveston, Harrisburg & San Antonio.*—Extended from Flatonia west 13 miles to Waelder, Texas.

This is a total of 32½ miles of new railroad, making 570 miles completed in the United States in 1874.

THE ILLINOIS RAILROAD AID LAW, passed in 1869, which probably had more to do than any other one thing with the enormous additions to the railroad mileage of the State made in that and the following years, has been declared unconstitutional in that special feature which made it attractive to the municipalities which voted to issue bonds under it. This decision, however, in no respect affects the validity of the bonds or the machinery for assessing and collecting the taxes by which their interest and principal are to be paid, but only the distribution of those taxes. The law was most cunningly devised to induce the largest possible issues of bonds, for it made the bonds attractive to investors by providing that they should be registered with the State Government, and that the assessments for paying them should be made and collected by the State authorities; so that any indisposition of the municipality to keep its contract would have little effect. On the other hand, it was provided that if the assessed value of the property of a municipality which had issued bonds in aid of a railroad should increase beyond the assessment of 1868, the State taxes on the increase of value, together with the taxes on the railroad so aided, should be diverted from the State treasury and devoted to the payment of the interest on these bonds. The result was that towns and counties were very liberal in voting aid to almost all lines which asked for it and seemed in any way likely to be useful, because it seemed likely that their taxes would be little if any affected thereby, as if they did not incur such debts they would virtually have to pay the State taxes of those who did. The law was passed especially for the benefit of the southern part of the State, then poorly provided with railroads, but nearly all parts, and the center especially, availed themselves of it very liberally. Now when the law has done about all the good and all the harm it could, it is declared invalid so far as it shifts the burden of taxation from the bond-issuing municipalities. They will now be compelled to pay the interest and principal of these bonds and at the same time their quota of the State tax in proportion to the assessed valuation of their property. Meanwhile the bondholders are affected only so far as the ability of their creditors to pay is affected. Many towns and counties will now, doubtless, feel these debts to be a heavy burden, and perhaps some of them would repudiate their debts but for the provision of the law which gives the duty of assessing and collecting the necessary taxes to the State officers. As it is, they have the roads they voted for, but they will have to pay for them themselves, which is really more than they expected.

THE POSTAL CAR QUESTION seems likely to become a question for the courts, and however we may deplore the antagonism, the positive refusal to come to an agreement, which makes such a resort necessary, it is perhaps well that the question of Congressional authority to compel the carrying of the mails in whatever way and for whatever pay it may prescribe be settled once for all by the authority to which legislature, executive and corporations must alike submit. Mr. Hinckley, President of the Philadelphia, Wilmington & Baltimore Company, in accordance with the declaration which he made a few months ago to the Postmaster General, has notified that officer that after July 1 his company will not carry the mails over its road in postal cars, but in ordinary baggage or freight cars, as was done before the introduction of postal cars; and it is announced that the Postmaster General will then begin suit against the company in the United States courts to compel the road to carry the mail in postal cars, as he prescribes. It must be remembered that the railroad company does not question the right of the Government to have the mail carried in postal cars *for a reasonable compensation*. What it claims (and has abundantly proved) is that the compensation offered is not reasonable, and that the company is not consulted as to the price for which it shall do the work. The contracts are, in fact, no contracts at all, only one of the parties taking any part in fixing their terms. The company has offered distinct terms which it claims to be reasonable, and more than that, has offered to submit the whole question to arbitration, neither of which offers have been accepted by the Government. The question as it will come before the courts is substantially this: Can Congress compel the railroad companies to carry for the Government at whatever rates it may prescribe?

## Figs. 40, 41 and 42.

The engravings with the above numbers, which were published with the Catechism of the Locomotive some months ago, were engraved on a scale of ¼ in.=1 foot. As some of our readers no doubt will remember, this scale was too small to show some of the parts and letters of reference clearly. We have therefore had the drawings lithographed to a scale of ¼ in.=1 foot and printed on colored paper. As a list of the parts designated by the letters of reference may be useful to many of our readers, it is given as follows:

*A*, Cylinders.
*B*, Main driving-axles.
*C*, Main connecting-rods.
*D*, Main crank-pins.
*E, E*, Truck-wheels.
*F*, Axle of trailing-wheels.
*G*, Fire-box.
*H H H*, Frames.
*I I*, Frame pads or clamps.
*J J*, Eccentrics.
*K*, Rockers.
*L*, Link.
*M*, Lifting-shaft.
*N*, Lifting-arms.
*O O*, Reverse-lever.
*P P*, Cylinder part of boiler.
*Q*, Smoke-box.
*R R*, Smoke-stack.
*S*, Pilot or cow-catcher.
*T*, Head-light.
*U*, Bell.
*V*, Sand-box.
*W*, Whistle.
*X*, Dome.
*Y Y*, Cab or house.
*Z*, Back or trailing-wheel crank-pin.
*A'* Pump air-chamber.
*B', B'*, Main driving-wheels.
*C' C' C'*, Feed-pipe.
*D'* Front platform.
*E'* Bumper timber.
*F', F'*, Back driving-wheels.
*G'* Coupling-pin.
*H'* Friction-plate.
*I'* Check-valve.
*K' K'*, Foot-board.
*L'* Lazy cock.
*M'* Mud drum.
*P'* Pump.
*R'* Drop-door of grate.
*S'* Steam gauge.
*a a'*, Tubes.
*b b*, Grates.
*c*, Furnace.
*d d*, Ash-pan.
*f f*, Exhaust nozzles or blast-pipes
*g*, Safety-valve lever.
*h h*, Cross-heads.
*i i*, Running-board.
*j*, Throttle stem.
*l*, Throttle-pipe.
*m*, T-pipe.
*o*, Steam-pipe.
*p*, Petticoat pipe.
*q*, Smoke-box door.
*r*, Piston.
*s*, Spark-deflector or cone.
*t*, Wire-netting in stack.
*u u u*, Boiler-lagging.
*v*, Safety valve.
*w w*, Sector or quadrant.
*x*, Blow-off cock.
*y*, Truck center-pin.
*z*, Throttle-lever.
*a' a'*, Tubes.
*b' b'*, Trunk frame.
*c' c'*, Bed-plate.
*d'*, Boiler brace.
*e' e'*, Sand pipe.
*f' f'*, Equalizing lever for driving wheels.
*g' g'*, Guide-bars or rods.
*h' h'*, Receptacle for sparks.
*i' i'*, Bell rope.
*j' j'*, Guide yoke.
*k'*, Valve-stem.
*l' l'*, Truck equalizing lever.
*m' m' m'*, Hand rail.
*n'*, Blow-off cock in mud drum.
*o'*, Spring balance.
*p'*, Pump plunger.
*q'*, Foot steps.
*r'*, Brace to smoke-box and frame.
*s' s'*, Steam-chest.
*t' t' t'*, Crown-bars.
*u'*, Head-light lamp.
*v'* Main valve.
*w'* Blow-off cock handle.
*x'*, Bell-crank for throttle-valve.
*y'*, Piston-rod.
*z'*, Draw-bar.

# General Railroad News.

## ELECTIONS AND APPOINTMENTS.

—The stockholders of the Caughnawaga Ship Canal Company met in Montreal, June 10, and elected the following di-

rectors: W. Shanley, J. F. Sincennes, John Pratt, J. M. Thibodeau, Hon. John Young, Montreal; Hon. S. W. Foster, Knowlton, Quebec; Hon. James S. Read, Ottawa, Can.; E. P. Colton, Irasburgh, Vt.; Lawrence Barnes, Burlington, Vt.; Franklin Fairbanks, St. Johnsbury, Vt.; John Gregory Smith, St. Albans, Vt.; John B. Page, Rutland, Vt.; Jacob Edwards, Boston, Mass. The board subsequently elected the following officers: Hon. John Young, President; John B. Page, Vice-President; M. Aylmer, Secretary; J. F. Sincennes, Treasurer.

—At the annual meeting of the stockholders of the Peoria, Pekin & Jacksonville Railroad Company, held at Pekin, Ill., June 11, Lucius Hopkins, James M. Constable, Richard Arnold, Edwin L. Trowbridge, Lebbeus Chapman, Jr., James F. Kelsey and John Allen were elected directors for the ensuing year. Subsequently at a meeting of the directors, Mr. Allen was unanimously re-elected President of the company. Lebbeus Chapman, Jr., was re-appointed Secretary. It is understood that Mr. Kelsey will be continued as the Superintendent or Managing Director of the company.

—The first board of directors of the Mount Ephraim & Blackwoodtown Railroad Company is as follows: David E. Marshall, J. Livermore, Charles Stevenson, Daniel E. Marshall, R. B. Stevenson, J. W. McCullough, J. R. Brace, Amos Stevenson, Joseph Dottrey, George C. Weatherby, Blackwoodtown, N. J.; John Shubert, J. G. Davis, Chew's Landing, N. J.; Chalkley Albertson, Haddonfield, N. J.; R. E. Meyan, Jas. E. Hayes, J. P. Michellon, Camden, N. J.

—Mr. W. S. Holden has been appointed purchasing agent of the Lake Shore & Tuscarawas Valley Railway Company.

—At the annual meeting of the Ashtabula, Youngstown & Pittsburgh Railroad Company in Ashtabula, O., June 10, the following directors were elected: W. P. Shinn, H. N. Barnes, William McCreery, T. D. Messler, H. Hubbard, R. F. Smith, C. D. Wick, W. Thaw, W. Harbaugh, A. C. Fisk, F. Harrington, W. Packard. Mr. McCreery declined to serve as President of the road for another term.

—The new board of directors of the Syracuse Northern Railroad Company has elected the following officers: President, J. J. Belden; Vice-President, Oren R. Earl; Treasurer, E. B. Judson; Secretary, R. D. W. Mann.

—The board of directors of the Pennsylvania Company has elected the following officers for the ensuing year: President, Thomas A. Scott; First Vice-President and General Manager, J. N. McCullough; Second Vice-President, William Thaw, Third Vice-President, H. J. Jewett; Secretary and Treasurer, W. H. Barnes.

—The board of directors of the Martha's Vineyard Railroad Company has organized permanently by electing the following officers: President, E. P. Carpenter, Foxboro, Mass.; Treasurer, James T. Pease, Edgartown, Mass.; Superintendent, Henry Ripley, New Bedford, Mass.

—The Suncook Valley Railroad Company at its annual meeting, May 28, elected the following directors: Samuel N. Bell, Frederick Smyth, M. V. R. Edgerley, Manchester, N. H.; Natt. Head, Hooksett, N. H.; L. B. Towle, Epsom, N. H.; Charles H. Carpenter, Pittsfield, N. H.

—At the annual meeting of the Suncook Valley Extension Railroad Company, May 28, the following directors were chosen: S. N. Bell, Frederick Smyth, James H. Colbath, Daniel E. Tuttle, Thomas Coggswell, John M. Durgin.

—The board of directors of the Swedesboro Railroad Company has re-elected J. S. Thompson, President, and D. B. Gill, Secretary and Treasurer, for the ensuing year. The road is leased to the West Jersey Company.

—In the list of directors of the Wisconsin Central Railroad Company given last week the name of Samuel Gould, of Boston, was accidentally omitted.

—Mr. Jacob B. Carpenter has been appointed Receiver of the Poughkeepsie & Eastern Railroad by the New York Supreme Court.

—The directors of the Rome, Watertown & Ogdensburg Railroad Company have re-elected the old officers, as follows: President, Marcellus Massey, New York; Vice-President, Talcott H. Camp, Watertown, N. Y.; Secretary and Treasurer, J. A. Lawyer, Watertown, N. Y.

—Mr. James Mexon has been appointed Chief Train Dispatcher of the Detroit Division of the Grand Trunk Railway, with office at Port Huron, Mich.

—At the annual meeting of the Chicago, Danville & Vincennes Railroad Company in Chicago, June 17, the following directors were re-elected for the ensuing year: J. W. Elwell, J. D. Fish, Matthew Taylor, Amos Tenney, W. D. Judson, New York; A. Gilbert, Rossville, Ill.; J. L. Donovan, Watseka, Ill.; E. Ellery, Chicago; George Nebeker, Covington, Ind.

—At the adjourned annual meeting of the Chesapeake & Ohio Canal Company in Annapolis, Md., June 17, A. P. Gorman was elected President, with the following directors: J. G. Berret, Michael Bannon, Daniel F. S. Biser, Gilmor Meredith, Greenbury M. Watkins and A. K. Stake. The only change from last year is the substitution of Mr. Stake for Patrick Hammill.

—William M. Phillips has been appointed Assistant Superintendent of the Low Grade Division of the Allegheny Valley Railroad, and has entered upon the discharge of his duties.

The new board of directors of the Keokuk & Des Moines Railway Company has elected the following officers: Henry A. Barling, President and Treasurer; C. Seguine Johnson, Vice President; Arthur Bridgman, Secretary.

—The directors of the Grand Rapids & Van Wert Railroad Company have elected the following officers: President, D. W. H. Howard, Toledo, O.; Vice-President, S. S. Laskey, Grand Rapids, O.; Treasurer, George Laskey, Grand Rapids, O.; Secretary, M. Shoemaker; Chief Engineer, O. M. Howard.

—The stockholders of the Southwestern & Rio Grande Railroad Company met in Nacogdoches, Texas, June 10, and elected the following directors: J. D. Martin, L. T. Barrit, B. Hardeman, Nacogdoches County, Tex.; W. C. Carrow, E. S. Hicks, W. P. Wilson, Shelby County, Tex.; L. L. Tompkins, James M. Foster, Tom Poland, N. W. Murphy, W. S. Haven, W. B. Hamilton, Shreveport, La.; H. G. Angle, Chicago, Ill. The officers elected were: President, W. S. Haven; Vice-President, W. H. Swift; Land Commissioner and Recording Secretary, L. T. Barrit: Secretary, W. D. Wylie; Treasurer, L. L. Tompkins; Chief Engineer, G. R. Wilson.

—Capt. D. W. Wellman, for two years past Chief Engineer of the Wisconsin Central Railroad, has been chosen City Engineer of St. Paul, Minn.

—At the annual meeting of the Michigan Central Railroad Company in Detroit, June 22, the following directors were elected: James F. Joy, Detroit, Mich.; Erastus Corning, Albany, N. Y.; John Jacob Astor, George F. Tallman, Moses Taylor, New York; Sidney Bartlett, J. W. Brooks, H. H. Hunnewell, Nathaniel Thayer, Boston. There is no change from last year in the board.

—The directors of the North Shore Railroad Company of Long Island have elected W. W. Hall, of New York, President, and C. K. Deutzch, of New York, Treasurer and Financial Agent.

—The first board of directors of the St. Louis & River des Peres Railroad Company is as follows: B. B. Waddell, Charles B. Howney, Michael Hammell. The office is in St. Louis, Mo.

## TRAFFIC AND EARNINGS.

—During the month of May the Utah Central Railroad carried 9,019 tons of freight, including 2,885 tons of coal and coke and 959 tons of lumber.

—The Utah Southern Railroad carried during May 5,790 tons of freight, including 1,777 tons of ore and bullion and 883 tons of coal and coke.

—The earnings of the Grand Trunk Railway for the week ending May 30 were: 1874, £39,600; 1873, £38,700; increase, £900, or 2⅓ per cent.

—The earnings of the Atlantic, Mississippi & Ohio Railroad for the month of March are reported as follows: 1874, $166,724; 1873, $188,672; decrease, $21,948, or 11⅝ per cent.

—The Wichita (Tex.) *Beacon* gives the number of cattle registered at Pond Creek from the commencement of this season's drive up to June 3, as follows, with their destinations:

| | |
|---|---|
| For Western territories | 13,572 |
| For Ellsworth (Kansas Pacific) | 43,410 |
| For Wichita (Atchison, Topeka & Santa Fe) | 48,669 |
| Yet on the trail | 45,000 |
| Total | 150,651 |

—The number of vessels of all kinds which passed through the Chesapeake & Delaware Canal during 1873 was 12,444, an average of about 71 per day during the season of navigation. The canal was closed for over a month by the break at St. George's last summer.

—The earnings of the Bingham Canon Railroad for the five months ending May 31 were $41,117.84, being $2,570 per mile. In May the road carried 4,458 tons of freight.

—The earnings of the Chesapeake & Ohio Canal for May were: 1874, $69,454; 1873, $62,712; increase, $6,742, or 10¾ per cent. The coal tonnage for the month was: 1874, 114,566; 1873, 105,660; increase, 8,906 tons, or 8⅓ per cent.

—The earnings of the Great Western Railway of Canada for the week ending May 29 were: 1874, £21,493; 1873, £24,998; decrease, £3,505, or 14 per cent.

—The coal traffic of the Corning, Cowanesque & Antrim Railroad for 1873 was as follows:

| | Tons. |
|---|---|
| Fall Brook Coal Company's mines | 342,466 |
| Morris Run mines | 327,384 |
| Blossburg mines | 321,207 |
| Total | 991,057 |

—The earnings of the Syracuse Northern Railroad for the year ending June 1, 1874, were:

| | |
|---|---|
| Earnings ($3,685 per mile) | $165,721 13 |
| Expenses (74.65 per cent.) | 123,709 83 |
| Net earnings ($934 per mile) | $42,011 30 |

—The earnings of the Mobile & Ohio Railroad for May were: 1874, $146,667; 1873, $184,037; decrease, $37,370, or 20¼ per cent. For the five months ending May 31 the earnings were: 1874, $963,864; 1873, $1,249,916; decrease, $286,052, or 22⅞ per cent.

—The earnings of the Toledo, Wabash & Western Railway for the first week in June were: 1874, $96,482; 1873, $128,138; decrease, $31,656, or 24¾ per cent.

—The earnings of the Rockford, Rock Island & St. Louis Railroad for the month of March, 1874, were $80,315.85; the expenditures for working expenses, rents and taxes, $60,199.92; the net earnings, $20,115.93, or $72 per mile. For the nine months ending with March the receipts were $684,539.72, the expenses $506,664.75, and the net earnings $177,874.97, or $635 per mile.

—The earnings of the Great Western Railway of Canada for the week ending June 5, were: 1874, £21,183; 1873, £23,452; decrease, £2,269, or 9⅝ per cent.

—The earnings of the Grand Trunk Railway for the week ending June 6, were: 1874, £43,400; 1873, £36,800; increase, £6,600, or 17⅞ per cent.

—Mr. E. P. Dorr, writing to the Buffalo *Commercial Advertiser* to defend the seaworthiness of the lake marine, says in closing: "But direct trade with Europe is impracticable. The vessels are too small and the route through the Canadian canals and down the St. Lawrence River is too long and dangerous. Such of our vessels as can go through these canals can never be made to pay in the direct trade with Europe. If we could get our large fine craft that trade from the upper lakes to Buffalo direct, it would perhaps be different; those vessels would compete with the best ships on the sea. Of the vessels now in use upon the lakes---they number nearly or quite 3,000 with a capacity of over 700,000 tons--one in five only can go through the Canadian canals. Of those that can pass through four-fifths are American and the rest Canadian. The Welland Canal is the key to all the Canadian canals. While we admit that the direct trade from the lakes to Europe, via St. Lawrence, will not pay expenses, we must insist that standard lake vessels are fit to navigate the ocean and to go all over the world, that they are better built, better equipped, and better officered and manned than are the same average number of vessels anywhere else in the world. If they wish to go out upon the ocean in the fall and pass the long winter in trade there, coming back to the lakes in the spring, they should be permitted to do so, and they should have the approbation of our people. If standard vessels, they are entitled---vessels and cargo---to be protected by insurance companies, to go anywhere on as good terms as vessels built upon the seaboard. It is but an act of common justice to so protect them."

—The earnings of the Toledo, Wabash & Western Railway for the year 1873 were:

| | |
|---|---|
| Earnings ($9,138 per mile) | $5,738,807 76 |
| Expenses (74.92 per cent.) | 4,299,413 63 |
| Net earnings ($2,292 per mile) | $1,439,394 13 |

—The earnings of the Denver & Rio Grande Railway for the second week in May were: 1874, $8,678; 1873, $10,206; decrease, $1,528, or 15 per cent.

## ANNUAL REPORTS.

### Louisville & Nashville.

This company owns the following railroads:

| | Miles. |
|---|---|
| Main Stem—Louisville to Nashville | 185.00 |
| Memphis Line—Memphis Junction to Memphis | 259.67 |
| Bardstown Branch | 17.30 |
| Knoxville Branch—Lebanon Junction to Livingston | 110.32 |
| Richmond Branch | 33.46 |
| Total owned | 605.75 |
| It works under lease: | |
| Glasgow Branch | 10.19 |
| Nashville & Decatur Railroad | 122 03 |
| The total worked by the company is therefore | 737.97 |
| It also controls, by the ownership of a majority of its stock and bonds, the South & North Alabama Railroad—Decatur to Montgomery | 182.00 |
| Total mileage of system | 919.97 |

Its equipment at the close of the year ending with June, 1873, consisted of 180 locomotives, 78 coaches, 28 baggage, 3 postal and 12 express cars—a total of 121 passenger train cars; 1,711 box, 22 caboose, 337 gondola, 434 flat and 400 low flat cars—a total of 2,954 freight cars; 34 boarding, 4 wrecking and 8 tool cars—a total of 46 service cars.

This property is represented by:

| | |
|---|---|
| Capital stock ($14,827 per mile owned) | $8 981,439 03 |
| Bonded debt ($24,466 per mile owned) | 14,820,500 00 |
| Total ($39,293 per mile) | $23,801,939 03 |

During the years reported the work done on the 606 miles owned was:

| | 1872-73. | 1871-72. |
|---|---|---|
| Passenger train mileage | 865,955 | ..... |
| Freight train mileage | 1,430,316 | ..... |
| Passenger mileage | 39,046,519 | 39 539,271 |
| Tonnage imleage | 141,649.448 | 122 588,171 |

The receipts and expenses therefor were in 1872-73:

| | Receipts. | Expenses. |
|---|---|---|
| Passenger | $1.406 833 56 | $1 201,091 05 |
| Express | 142,588 66 | ..... |
| Mail | 92,598 44 | ..... |
| Train privileges | 3 770 80 | ..... |
| Rent of passenger cars | 22,929 99 | ..... |
| Freight | 3,135.797 91 | 2,297,212 24 |
| Rent of freight cars | 45 261 57 | ..... |
| Detention of freight cars | 777 10 | ..... |
| Rent of engines | 36,589 05 | ..... |
| Rents, etc. | 22,278 96 | ..... |
| Total | $4,909,426 44 | $3 498,303 29 |
| This leaves as net earnings | | $1,411,123 15 |

out of which were paid the interest on the funded debt and 7 per cent. dividends on the stock.

The following information is given for each of the lines owned, separately, the figures over the columns denoting the lines as follows: 1, Main Stem; 2, Bardstown Branch; 3, Knoxville Branch; 4, Richmond Branch: 5, Memphis Line; 6, Total of these lines:

| | 1. | 2. | 3 | 4. | 5. | 6. |
|---|---|---|---|---|---|---|
| Earnings per passenger train mile | $2 11 | $1 98 | $1 60 | $1 50 | $1 76 | $1 90 |
| Expenses per passenger train mile | 1 42 | 1 29 | 1 53 | 1 28 | 1 33 | 1 42 |
| Earnings per freight train mile | 2 41 | 2 13 | 1 69 | 1 72 | 1 98 | 2 19 |
| Expenses per freight train mile | 1 59 | 1 48 | 1 64 | 1 43 | 1 61 | 1 58 |
| Earnings per mile of road | 15,129 | 1,325 | 2.901 | 1,071 | 6,669 | 8,105 |
| Expenses per mile of road | 9,625 | 894 | 2,805 | 904 | 5,247 | 5,776 |
| Proportion of expenses to receipts, per cent. | 63.62 | 67.47 | 96.72 | 84.41 | 78.67 | 73.16 |
| Receipts per passenger per mile, cents | 3.481 | 3.522 | 3.428 | 3.818 | 3.774 | 3.603 |
| Expense per passenger per mile, cents | 2.202 | 2.321 | 3.283 | 3.269 | 2.856 | 1.702 |
| Expense per passenger train car per mile, cts. | 29.12 | 29.00 | 40.98 | 33.61 | 31.80 | 31.80 |
| Receipt per ton of freight per mile, cts | 2.29 | 4.773 | 2.463 | 3.21 | 2.21 | 2.21 |
| Expense per ton of freight per mile, cts. | 1.44 | 3 316 | 2.397 | 2 68 | 1.79 | 1 60 |
| Expense per freight car per mile, cents. | 9.12 | 17.84 | 12.17 | 12.17 | 12 12 | 10.20 |
| Expense per ton per mile of paying and dead weight, cents | 0.637 | 1,333 | 0.971 | 0.975 | 0.823 | 0.71 |

Of the leased lines the earnings and expenses were:

| | |
|---|---|
| *Glasgow Branch.* | |
| Earnings ($1.761 per mile) | $17,950 99 |
| Expenses (72.1 per cent.) | 12,943 09 |
| Net earnings | $5,007 90 |
| *Nashville & Decatur Railroad.* | |
| Earnings $5,697 per mile) | $695,046 21 |
| Expenses (84.3 per cent.) | 585,887 72 |
| Net earnings | $109,158 49 |

Since the year covered by this report the name of the corporation has been changed to "Louisville & Nashville and Great Southern."

### Mobile & Ohio.

This company owns a line from Mobile, Ala., northward to the Mississippi at Columbus, Ky., 472 miles, with branches from Narkeeta, Miss., to Gainesville, Ala., 21 miles; from Artesia, Miss., to Columbus, 14 miles; from Muldon, Miss., to Aberdeen, 10 miles. The Oktibbeha Branch has been completed, and is in use from Artesia, Miss., west 4¾ miles, making the company's total mileage at the close of the year 521½ miles. The rest of the last-named branch, from the present terminus to Starkville, is under contract.

The earnings and expenses for 1873, as compared with 1872, were as follows:

| Earnings. | 1873. | 1872. |
|---|---|---|
| Passengers | $ 596,605 14 | $ 734,970 39 |
| Freight | 2,074,794 84 | 2,089,681 25 |
| Mails | 61,727 40 | 60,7[illegible]5 95 |
| Express | 68,000 00 | 67,150 00 |
| Total earnings | $2,801,127 38 | $2,952,507 89 |
| Repairs of roadway | 514,347 85 | 574,768 35 |
| " machinery | 522,037 21 | 522,211 34 |
| Conducting transportation | 820,378 47 | 792,076 92 |
| Bureau expenses | 39,500 86 | 41,162 37 |
| Total expenses | $1,896,264 39 | $1,930,219 18 |
| Net earnings | $904,862 99 | $1,022,288 41 |

The decrease in passenger earnings was $138,365.25, or 18.83 per cent.; in freight earnings, $14,886.41, or 0.71 per cent.; in the total earnings, $151,380.21, or 5.13 per cent. There was a decrease of $33,954.79, or 1.76 per cent., in expenses, and a decrease of $117,425.42, or 8.85 per cent. in net earnings. The expenses were 67.70 per cent of earnings in 1873 against 65.38 per cent in 1872.

The earnings per mile for a series of years were:

| | 1870. | 1871. | 1872. | 1873. |
|---|---|---|---|---|
| From passengers | $1,134 | $1,320 | $1,424 | $1,156 |
| " freight | 3,411 | 3,485 | 4,049 | 4,021 |
| " mail and express | 201 | 201 | 247 | 251 |
| Total | $4,746 | $5,006 | $ 5,720 | $ 5,428 |

The work of the year was as follows:

| | 1873. | 1872. |
|---|---|---|
| Passenger train mileage | 540,636 | 681,122 |
| Freight " " | 676,626½ | 638,218 |
| Gravel " " | 177,114 | 203,856 |
| Switching " " | 112,645 | 98,286 |
| Total train mileage | 1,507,021½ | 1,621,481 |
| Passengers carried | 322,717 | 398,884 |
| Passenger mileage | 14,183,436 | 16,312,518 |
| Receipts per passenger per mile | 4.01 cents. | 4.48 cents. |
| Tons of freight carried | 347,588 | ..... |
| Tonnage mileage | 54,201,545 | 55,399,302 |
| Bales of cotton carried | 206,286 | 184,676 |
| Receipts per ton per mile | 3.8[illegible] cents. | 3.80 cents. |

The mileage of freight cars during the year was as follows:

| | Loads. | Empty. | Total. |
|---|---|---|---|
| Main line northward | 2,771,671 | 2,850.011 | 5,621,682 |
| Main line southward | 5,501,030 | 144,150 | 5,645,180 |
| Branches | 77,683 | 13,776 | 91,459 |
| Totals | 8,350,384 | 3,007,937 | 11,358,321 |

From this it appears that 50.7 per cent. of all the north-

bound cars ran empty, and that the mileage of empty cars was 26.48 per cent. of the whole car movement. The total mileage of passenger train cars was 2,525,030 miles.

The cost of motive power per engine mile was: Southern Division, 28.7 cents; Middle Division, 34.55 cents; Northern Division, 25.5 cents. This does not include the reconstruction account, which was unusually large, a number of worn-out engines having been rebuilt during the year.

There were 93 engines in actual use during the year, of which five were new Baldwin engines bought in January. The car equipment consists of 37 passenger, 1 sleeping, 11 baggage and mail, and 6 express cars; 678 box, 290 platform and 38 stock cars. Two express and 25 stock cars have been built, and work commenced on 100 box cars, which are much needed. A new round-house has been begun at Whistler, where the main shops are located, the old one having fallen into decay and been removed.

New general offices have been erected in Mobile; several station buildings have been renovated and the water tanks along the line have been generally overhauled and renewed where necessary.

The road is now divided into five freight divisions, the termini being Mobile, Shubuta, Macon, Baldwin, Jackson and Columbus. New turn-tables have been put in at Macon an Baldwin, and new sidings at all the division termini except Jackson, Tenn., where the were not needed.

The Road Department has used during the year 24¼ miles of new iron, 232,005 new ties, 218,795 new fish-bar bolts, and a large number of spikes. The road-bed and bridges are generally in good condition, but some new iron will be required this year.

During the year a consolidated mortgage has been executed and $15,000,000 of bonds are to be issued under it. Of the whole amount of bonds, $12,500,000 are deposited with the trustees for the protection of bonds issued under former mortgages; the remainder are to be used in payment of floating debt and for improvements of the property. A large majority of the stockholders subscribed for their proportion of the new stock authorized a year ago and paid the first installment of $5 per share, but very many were prevented by the panic from paying any further installments. To utilize the untaken stock, bonds were issued convertible into stock, at the pleasure of the holder, at the same price at which it had been forfeited to the company, all stockholders having been allowed stock to the full extent of the payment made.

The capital account stood as follows at the close of the year:

| Capital stock: | 1873. | 1872. |
|---|---|---|
| Active, 53,206 shares | $5,320,600.00 | ..... |
| Convertible reserve, 40,000 shares, less $847,975 convertible bonds issued | 3,152,025.00 | ..... |
| Total stock | $8,472,625.00 | $4,466,475.84 |
| Funded debt: | | |
| First mortgage bonds | $9,719,120.00 | $9,550,540.60 |
| Second mortgage bonds | 1,443,848.47 | 1,235,604.46 |
| Gainesville Branch bonds | 53,000.00 | 53,000.00 |
| Convertible 8 per cent. bonds | 847,975.00 | ..... |
| Total funded debt | $12,073,953.47 | $10,839,144.46 |
| Floating debt: | | |
| Bills payable | $1,018,882.45 | 862,490.04 |
| Auditors' and pay roll warrants | 285,352.92 | 408,995.66 |
| Call loans | 147,412.40 | ..... |
| Total floating debt | $1,451,647.77 | $1,271,485.70 |
| Land Bureau | $93,026.46 | $313,504.26 |
| Transportation Dept. net earnings | 904,862.99 | 1,022,288.41 |
| Profit and loss | 25,262.89 | 1,550,870.83 |
| | $23,021,378.58 | $19,463,769.50 |

The capital stock is now $16,247, and the funded debt $23,152 per mile.

## Pennsylvania Company.

The following summary of the annual report of this company for 1873 has been published:

The earnings of the different leased lines were as follows:

| *Pittsburgh, Fort Wayne & Chicago.* | |
|---|---|
| Earnings ($20.554 per mile) | $9,619,074 36 |
| Expenses (63.3 per cent) | 6,097,041 99 |
| Net earnings ($7,526 per mile) | $3,522,032 37 |
| Rental, interest, etc | 2,617,177 24 |
| Net profit | $904,855 13 |
| *New Castle & Beaver Valley.* | |
| Earnings ($23,406 per mile) | $351,089 48 |
| Expenses (45.17 per cent.) | 158 574 75 |
| Net earnings ($12,834 per mile) | $19 ,514 73 |
| Rental and interest | 140,435 79 |
| Net profit. | $52,078 94 |
| *Lawrence Railroad.* | |
| Earnings ($9,018 per mile) | $189,383 38 |
| Expenses (59.86 per cent.) | 113,371 05 |
| Net earnings ($3,620 per mile) | $76,011 33 |
| Rental and interest | 75,752 96 |
| Net profit | $258 37 |
| *Erie & Pittsburgh.* | |
| Earnings ($13,550 per mile) | $1,165,292 65 |
| Expenses (58 4 per cent.) | 680,893 88 |
| Net earnings ($5,633 per mile) | $484,398 77 |
| Rental and interest | 380,626 00 |
| Net profit | $103,772 77 |
| *Cleveland & Pittsburgh.* | |
| Earnings ($18,451 per mile) | $3,671,735 25 |
| Expenses (51.06 per cent.) | 1,874,722 15 |
| Net earnings ($9,031 per mile) | $1,797,013 10 |
| Rental and interest | 1,337,353 51 |
| Net profit | $459,659 59 |
| *Jeffersonville, Madison & Indianapolis.* | |
| Earnings ($6,361 per mile) | $1,437,576 91 |
| Expenses (69 per cent.) | 991,377 03 |
| Net earnings ($1,974 per mile) | $446.199 88 |
| Rental and interest | 535,235 60 |
| Deficit | $89,035 72 |

There has been an aggregate expenditure for betterments on all these lines during the year, as follows:

| | |
|---|---|
| Pittsburgh, Fort Wayne & Chicago | $1,685,686 00 |
| Erie & Pittsburgh | 14,992 01 |
| Cleveland & Pittsburgh | 672,372 91 |
| Jeffersonville, Madison & Indianapolis | 174.045 69 |
| | $2,547,096 61 |
| The final result to the Pennsylvania Company, after paying all expenses, rentals, interests, etc., shows a net profit of | $1,238,310.00 |
| Out of which dividends have been paid on preferred and common stock | 570,000.00 |
| Leaving a balance of | $668,310.00 |

The lines are now amply supplied with facilities to meet not only present demands, but also a much increased volume of business, and the condition of the track and rolling stock will enable the business to be moved with economy and dispatch.

On the Fort Wayne road 49 per cent. of the entire line was relaid with new rail, including 6,000 tons of steel rail, and 29 per cent. of the ties were renewed.

On the Cleveland & Pittsburgh Railroad 35 per cent. of the line was relaid with new iron.

In addition to the lines hereinbefore enumerated, and which are operated under leases, this company has also worked during the past year, on account of the proprietary companies, the Indianapolis & Vincennes road, the Ashtabula, Youngstown & Pittsburgh Railroad, the Toledo, Tiffin & Eastern Railroad, and the completed portion of the Mansfield, Coldwater & Lake Michigan Railroad.

The Ashtabula line deserves special mention, as furnishing an additional outlet to the lakes, and thereby facilitating the movement of lumber, ore and coal. The harbor has been improved so that vessels drawing fourteen feet of water can unload at the wharves of the company, and there is every prospect of the road developing a lucrative business. There was expended in betterments on this line, in 1873, but a very small sum—$646.

The Toledo line forms a good connection with one of the largest grain depots of the West, by an extremely favorable route, and the road has local advantages which should secure it a large traffic. Special attention is being paid to the increase of its tonnage and with favorable results.

Special reference is made to the recent death of Mr. Thomson in the concluding paragraph of the report.

## THE SCRAP HEAP.

### British Rail Exports.

The exports of railroad from Great Britain in the month of May, and the five months ending with May, were:

| | May. | 5 mos. |
|---|---|---|
| 1874 | 97,587 tons. | 335,093 tons. |
| 1873 | 85,975 " | 274 795 " |
| Increase | 11,612 tons. | 60,298 tons. |

The exports of this iron to the United States were:

| | May. | 5 mos. |
|---|---|---|
| 1874 | 10,097 tons. | 52,445 tons. |
| 1873 | 20,857 " | 102,451 " |
| Decrease | 10,760 tons. | 50,007 tons. |

The total exports to this country were sufficient to lay about 500 miles of road, which is as much as was constructed during that time; but during the same period probably not less than 4,000 miles needed renewing.

### Dining Arrangements for Passengers.

The General Superintendent of the Lake Shore & Michigan Southern Railway has issued the following general order, which will undoubtedly be appreciated by the travelling public:

"It is of much importance to the comfort of strangers upon the road that they shall be notified of the opportunities for refreshment, in order to avail themselves of them promptly.

"Conductors on passenger trains will please give notice, in all the coaches, of the approach to stations at which the train stops for meals; informing passengers that they can get breakfast, lunch, dinner or supper, as the case may be, and of the length of time that the train will stop. They will also require the brakemen to repeat the announcement in the coaches, just before the train stops.

"Before leaving any station at which the train stops for meals, the conductor will go to the dining room and lunch room, and give notice of the departure of his train, so as to be sure that no passengers are left behind for want of notice."

### Joliet Iron & Steel Company.

A thorough examination has been made of the books and affairs of this company by order of the bankruptcy court, in order to determine the truth of certain allegations of fraud made by some of the creditors. The examination showed that the books were correct and the assets in the same condition as when the petition in bankruptcy was filed, the charges of fraud being entirely disproved.

## OLD AND NEW ROADS.

### St. Louis Union Depot.

The Union Depot Company has already commenced work in St. Louis, though the City Council has not yet passed the ordinance allowing the company to lay the necessary connecting tracks. There is much preliminary work which can be done without regard to the ordinance.

The citizens' committee has adopted the plans prepared by the engineers for the new entrance of the Missouri Pacific into St. Louis and the connection with the Union Depot.

### St. Louis Connecting.

Captain James B. Eads, Chief Engineer of the St. Louis Bridge, has written a letter recommending the plan of this company for a track to connect the various roads entering St. Louis from the West and South with the bridge and with the levee, and for a system of warehouses to be provided in connection with that track.

### Minnesota & Northwestern.

It is said that the building of the line from Wells, Minn., to Mankato will have to be given up, as it is impossible to procure money for Minnesota roads, owing mainly to hostile legislation.

### Atchison, Topeka & Sante Fe.

The people of St. Joseph, Mo., are trying to persuade this company to run its trains through to St. Joseph, instead of stopping at Atchison. It is said that the company is willing to do this provided St. Joseph will pay the $20,000 per year asked for the use of the track from Atchison to St. Joseph.

### Gulf, Colorado & Santa Fe.

The County Court of Galveston County, having received the registry lists and thrown out all the names of those disqualified to vote, have found that the required two-thirds of the registered voters have voted for the subscription of $500,000 to the stock of this company and that the proposition is carried. The vote at the election in favor of the proposition was 3,068, but the number registered was 5,168, two-thirds of which was 3,438. The County Court, however, struck off 732 names, leaving 4,425 on the registry, two-thirds of which is 2,950 or 118 less than the votes cast.

It seems just possible that at some future day when the tax imposed to pay the interest on this $500,000 becomes irksome, exception may be taken to the legality of this action, and some one mry suggest that the County Court should have added to the registry the names of those who had become entitled to vote since the last election, which might have made a difference in the result.

### Atlantic, Mississippi & Ohio.

This road is now carrying to Petersburg and Norfolk, Va., considerable grain in bulk, which comes from St. Louis over the St. Louis & Iron Mountain, the Nashville, Chattanooga & St. Louis and the East Tennessee, Virginia & Georgia roads.

Considerable discussion has been excited in Richmond by the refusal of the Adams Express Company to interchange business and pro-rate charges with the express line over this road. The reason for this refusal is that the railroad company declined proposals from the Adams Company to do the express business over the road and has organized an express line of its own. Adams Express line, however, runs over the Richmond & Danville road and refuses to take Richmond express freight from the Atlantic, Mississippi & Ohio at Burkeville, causing considerable trouble for Richmond people.

### Sinnemahoning & Clearfield.

Preliminary surveys of this proposed line have been made, and the route is said to be very good. The road will run from Kartham, in Clearfield County, Pa., northeast down the West Branch of the Susquehanna to the month of the Sinnemahoning, where it will connect with the Philadelphia & Erie. It will open an iron and lumber region, and an extension of 10 miles would carry it to the Snow Shoe coal mines.

### Butler & Millerstown.

It is proposed to build a narrow-gauge road from Millerstown, Pa., southwest about 10 miles to Butler, the terminus of the Butler Branch of the West Pennsylvania road. About one-third of the stock has been subscribed for.

### Caledonia & Mississippi.

Ground has been broken on this road and the grading is contracted for, to be finished by August 1. It is to run from Caledonia, Minn., east about 10 miles to the Mississippi.

### Burlington & Lamoille Valley.

The committee appointed some time since by the Mayor of Burlington, Vt., reports that the line through Lamoille Valley to connect Burlington with the Vermont Division of the Portland and Ogdensburg can be built for $750,000. An effort is to be made to build the road.

### Memphis & Kansas City.

The State of Arkansas having voted to this company all lands forfeited for taxes in certain counties, the company now offers $2.50 per acre in stock to the original owners of such lands provided they will give it a quit-claim deed.

### Washington City, Virginia Midland & Great Southern.

An arrangement has been made by which the passenger trains of this road, instead of being ferried across the Potomac to East Alexandria, will run to Washington over the Alexandria & Washington road and then over the Baltimore & Potomac to Benning's Station, where they will be transferred to the East Alexandria Branch of the Baltimore & Ohio.

### New York Central & Hudson River.

Ballasting the new tracks near Fort Plain is being hurried forward. Gravel is used for ballast, from a bank at St. Johnsville. The Utica *Herald* says that on Sunday, June 14, Superintendent Burroughs with 60 men laid 4¼ miles of steel rails on the new freight track just west of Canandaigua, a pretty heavy day's work.

### Northern New York.

The Northern New York Iron & Mining Company's road has been completed and was opened June 24. It is 1½ miles long, from the Rome, Waterford & Ogdensburg Railroad at Antwerp, N. Y., to the Dixon ore bed.

### Shreveport & Southwestern.

This company has been consolidated with a newly organized Texas company, the Southwestern & Rio Grande.

### Southwestern & Rio Grande.

This company was organized under a charter from the State of Texas, at Nacogdoches, Tex., June 10, and the Shreveport & Southwestern Company of Louisiana has since been consolidated with it. The road is to run from Shreveport, La., across the whole of Texas to the Rio Grande at the mouth of the Pecos, and will be about 500 miles long.

### International.

The Austin (Tex.) correspondent of the Galveston *News* says, under date of June 11:

"As intimated by telegram to the *News* last week, the four judges qualified to sit are equally divided in opinion on the International mandamus case, hence the two opinions, if given, could have no practical effect. It now devolves on Governor Coke to appoint a member of the bar to sit with these four judges in the case. Judge W. P. Ballinger has been suggested."

Later dispatches, however, state that the constitutional provision on this point is so indefinite that it is very doubtful whether any action can be taken in the case or not. The carrying out of the compromise with the State on the subsidy question is dependent on the decision in this case.

### Santa Cruz.

A contract has been let for the Soquel Bridge, and the San Leandro Bridge will be let shortly. Negotiations are going on for the iron for the first 15 miles, the grading of which will soon be finished.

### Denver & Rio Grande.

An extension of the Canon Branch from Labran to Canon City, nine miles, is expected to be completed and opened in July.

### Baltimore & Drum Point.

Work on this road has been suspended since last Fall, but will be resumed when the county subscriptions are confirmed. The whole length of the road will be 76 miles, of which seven miles are graded. The line from Baltimore to Annapolis will be 23 miles long, for eight of which the Annapolis & Elkridge will be used, leaving only 15 miles to build.

### Missisquoi & Black Rivers.

The route of this road, of which a part was recently put under contract, is from Richmond, P. Q., the junction of the Grand Trunk's main line and Quebec Branch, south by west about 55 miles to Richford on the Southeastern road.

### Connecticut Railroad Commission.

The bill to reorganize the commission and give the appointment of the commissioners to the Governor has been favorably reported by the committee, and, it is said, is pretty sure to pass the Legislature.

### Montpelier & Wells River.

An agreement has been made between this company and the Central Vermont by which the Central Vermont secures the use of the Montpelier & Wells River track for some two miles, from Montpelier to the Coffee House, for its proposed new line from Montpelier to Barre. In return for this the Central Vermont depot in Montpelier is to be repaired and used in common by both roads, and the Wells River trains will have the right of running to Montpelier Junction over the Central.

### Erie.

The London *Railway News* publishes the following list of directors proposed for election at the annual meeting next month: Hugh J. Jewett (President), Thomas A. Scott, E. D. Morgan, F. Schuchardt, S. L. M. Barlow, H. R. Baltzer, J. Taylor Johnston, Homer Ramsdell, John A. C. Gray, Giles Hotchkiss, Lucius Robinson, H. L. Lansing, Marshal O. Roberts, Henry G. Stebbins, Cortlandt Parker, J. T. Woodward and R. Suydam Grant. Those of this list who are in the present board are Messrs. Morgan, Schuchardt, Barlow, Baltzer, Johnston, Ramsdell, Hotchkiss, Robinson and Parker.

At a meeting of the directors held June 22 it was resolved that the officers of the company take action to bring conspira-

tors against the company to justice, either here or in Europe. This action, it would appear, was predicated upon dispatches said to have been sent from New York to London, stating that a receiver for the company had been appointed, and that proceedings in bankruptcy would soon be instituted. It is desired, if possible, to put a stop to the spreading of such rumors intended to influence the price of the stock.

### Wallkill Valley.

The necessary papers for the commencement of a foreclosure suit were filed in the County Clerk's office of Ulster County, N. Y., June 13, by the attorneys for the first-mortgage bondholders.

### Berks County.

The last rail on this road was laid June 18, and the road was formally opened from Reading, Pa., through to Slatington, June 20. The whole length of the road is 44 miles. It is intended as an extension of the Wilmington & Reading road northward to a connection with the Lehigh Valley.

### Selma, Marion & Memphis.

The bondholders held a meeting in New York, June 18, and received a statement of the condition and prospects of the company from Mr. A. J. White, the acting President. They afterwards chose Mr. A. S. Sullivan, counsel.

The bonds indorsed by the State of Alabama amount to $750,000. The company now proposes to make a new mortgage, issue new bonds and to exchange a portion of them for the old bonds and use the surplus to complete the road to Memphis. The proposition was submitted to the bondholders, and an opinion upon the legality of the transaction having been obtained, at a second meeting, held June 20, they accepted the proposition. A committee, with Mr. S. Sabring as chairman, was appointed to consult with bondholders not present.

### Louisville & Nashville.

This company has negotiated in England £400,000 ($2,000,000) 6 per cent. first mortgage bonds of the (leased) South & North Alabama road.

### Grand Trunk.

A special meeting of the stockholders will be held in London, England, July 9, to vote on the question of accepting the act for the issue of consolidated debenture stock, passed in 1874. If the act is accepted, authority will be asked from the stockholders to issue such portion of said stock as may be deemed best.

### St. Paul & Pacific.

The Court of Common Pleas at St. Paul, Minn., has declined to appoint a receiver for this road on the application of representatives of the Dutch bondholders. The Court held that, from all that has been made to appear, the company is not insolvent, the road is good security for the bonds and the management is efficient. It is therefore not for the interest of the creditors, including the petitioners themselves, that a receiver should be appointed.

### Midland of Canada.

The change of gauge from 5 ft. 6 in. to 4 ft. 8½ in. was completed June 15. The road is 86 miles long, from Port Hope, Ont., to Orillia, with a branch 33 miles long to Lakefield, making 119 miles of road changed. The change was rendered necessary by that of the Grand Trunk, which is the Midland's main railroad connection.

### Dallas & Wichita.

A correspondent informs us that work on this road is progressing actively. The line of the road is through one of the best agricultural districts of Texas. In Archer and Wichita counties, about 150 miles west by north from Dallas, are very extensive deposits of copper ore, which the road is expected to reach.

### Peoria, Pekin & Jacksonville.

This company is about to construct an iron bridge over the Illinois River at Pekin. The road is said to be in excellent condition.

### Baltimore & Ohio.

The bill to authorize this company to change the location of the road in the District of Columbia, and to build a branch, has passed both houses of Congress and has been signed by the President.

The new grain elevator at Locust Point, opposite Baltimore, is rapidly approaching completion and will probably be opened July 1. The ground plan of the elevator measures 326x96 feet, exclusive of a fire-proof engine-house, 42x42 feet, which is located on the land side. The height is 170 feet from the water to the peak of the roof. There are 211 bins, measuring 11½ by 11¼ feet, and their elevations are as follows: 104, 67 feet high; 58, 86 feet high, and 54, 60 feet high.

The machinery will be driven by two engines of 300 horse power each, built by the Fishkill Landing Machine Works, Fishkill on the Hudson, New York. Three large boilers have been erected by the company's Master Machinist, Mr. J. C. Davis. The entire structure has been covered by the company on the sides with iron and roofed with slate by contract. On either side of the elevator are eight iron doors, 6 by 10 feet, and over each door is located a shipping spout. At the end of the elevator is also located a door and a shipping spout. There are 16 large-size Fairbanks scales. Two tracks enter it, and a track is located on either side. A wharf twelve feet wide runs around the entire front. A dredging machine is now at work, and the depth of the water will be increased to twenty-four feet. The capacity of the elevator will be 1,500,000 bushels, and five large ships can be accommodated at a time.

Work on the foundations was commenced 15 months ago, and has been continued since without a stoppage. Some idea of the labor involved may be formed from the fact that 11,750 piles, varying in length from 50 to 80 feet, were driven for the foundations. Much of the work has been done in the company's shops.

### Golden City & South Platte.

This road is about 20 miles long, from Golden, Col., southeast to the Denver & Rio Grande at Plum Creek. It will connect at Golden with the Colorado Central and at Bear Creek with the Denver & South Park. The road is very nearly completed ready for the iron. It is to be of 3-feet gauge.

### Lake Ontario Shore.

The work of completing the road to Charlotte, N. Y., has been commenced. The branch from Charlotte to Rochester is to be built as soon as the track is laid to Charlotte.

### Erie Canal.

The Buffalo Board of Trade has passed resolutions urging the expediency of having a survey of the Erie Canal made by Government engineers with a view to its improvement to its maximum capacity for furnishing cheap transportation.

### Valley, of Virginia.

A call has been issued for a convention to be held in Staunton, Va., September 9, 1872, to advocate the proposed extension of the Valley Railroad southwest to the Tennessee line.

The engineers have been laying off the bridge over North River, which will be of iron and about 1,000 feet long.

There is some talk of hurrying up the work on a section from Staunton southwest into Rockbridge County, so as to have that section completed this summer. This could be done by concentrating the force now distributed along the line.

### Laclede & Fort Scott.

A private meeting of stockholders was held in St. Louis, June 15. During the meeting a summons was served on the officers by the attorneys of Mr. Burgess, the original contractor for the road, who holds a judgment for $60,000 for work done, and has a suit pending for $300,000 more, besides damages for breach of contract.

### Union Pacific.

The place chosen for the permanent junction of this road and the Central Pacific is at Ogden, Utah, its present location. Brigham Young has given a tract of 133 acres of land on which to build the depot, shops and other necessary buildings. The junction of the Utah Central and Utah Northern roads will also be at this point.

### Illinois & St. Louis Bridge.

Preparations are being made for a formal opening of the bridge with a grand celebration on the Fourth of July. The programme as arranged by a committee provides that the announcement of the formal opening of the bridge shall be made by the President of the United States. Congratulatory addresses will be made by the governors of Missouri and Illinois, to which Captain Eads will respond; an address will be delivered by ex-Gov. B. Gratz Brown, there will be a procession, a banquet and at night a display of fireworks from the bridge itself. It is intended to make the celebration a very fine one.

### Philadelphia & Erie.

Since the opening of the Eastern Extension of the Allegheny Valley, this road has been receiving from the new line from 40 to 60 car-loads of oil daily at Driftwood. This oil goes to New York by way of Harrisburg and the Allentown Line. The run of 280 miles from Red Bank to Harrisburg is made in about 26 hours.

On the new schedule which took effect June 1, the Niagara Express trains were put on. The passenger and east-bound freight business of the eastern end of the road is increasing, and is equal to if not greater than heretofore.

### Visalia Branch.

The surveys have been completed and contracts let for the grading and the ties.

### West River.

The town of Townshend, Vt., has raised the money needed for the surveys and location of this proposed road, and work will be commenced at once.

### New Bonds.

The New York Central & Hudson River Company invites proposals for $1,000,000 7 per cent. first-mortgage bonds, running till 1903. Proposals will be received at the Treasurer's office in New York until June 29.

The New York & Harlem Company asks for proposals for $1,000,000 7 per cent. consolidated mortgage bonds, principal due in 1900. Proposals will be received by the Treasurer in New York until June 29.

### The Illinois Tax on Capital Stock.

In the case of the Rockford, Rock Island & St. Louis Company, the Illinois Supreme Court has refused to enjoin the collection of the tax on the capital stock as assessed by the State Board of Equalization. The court held that the assessment is not oppressive or unjust and that, under the constitution and laws of Illinois, the Board of Equalization has power to assess taxes on the capital stock of all corporations which are created by or under the laws of Illinois.

### Chicago & Alton.

The United States Circuit Court at Springfield, Ill., has decided against the application to transfer to that Court the suit of the Railroad Commissioners against the Chicago & Alton Company, and has quashed the writ of *certiorari*. The suit, therefore, goes back to the State Courts, or rather remains there.

### North Shore.

An attempt is to be made to put this proposed road under construction. It was chartered in 1873 and the line has been surveyed and a little grading done, but no work has been going on for some time past. The road is to run from Richmond Hill, N. Y., along the north shore of Long Island to Orient, near the eastern end of the island.

### Hoosac Tunnel Line.

In the Massachusetts Legislature nothing further has been done and no conclusion has been reached, except that Mr. Crane's Atlantic & Ontario Trust Company's bill was defeated by the decisive vote of 20 to 2 in the Senate. None of the companies whose roads are in the tunnel line are now advocating consolidation and probably will not do so until the tunnel is entirely completed and paid for by the State.

### Richmond, Fredericksburg & Potomac.

A fast express train has been put on from Richmond to Baltimore, which leaves Richmond at 7:30 a. m., and reaches Baltimore 1:25 p. m., making the run of 159 miles in six hours, no very remarkable speed north of Virginia perhaps. The South-bound train leaves Baltimore 4:10 p. m., and reaches Richmond at 10:30 p. m.

### Utica & Black River.

Tracklaying has been commenced on the extension from Theresa, N. Y., northward to Morristown.

### Rochester & State Line.

Work has been recommenced on the line from Leroy, N. Y., southwest. The ballasting on the line from Rochester to Leroy is being finished, and trains will soon be put on.

### California Pacific.

Notice is given that the July coupons on $2,250,000 first-mortgage and $1,600,000 second-mortgage bonds of this company will be paid on and after July 1, on presentation at the National Park Bank in New York.

Reports have been freely circulated for some time past, especially in California, that these July coupons would not be paid.

### New York Elevated Railroad.

A meeting of merchants was held in New York, June 22, Mr. Abram S. Hewitt presiding, and resolutions were passed urging the Governor to approve the bill lately passed by the Legislature authorizing the extension of this road from its present terminus at Thirty-fourth street to Fifty-ninth street. Speeches were made eulogising the road as the only plan of rapid transit yet put into practical use.

### Duxbury & Cohassett.

The last rail has been laid on the extension of this road, which is itself an extension of the Old Colony's South Shore Branch. The extension is four miles long, from the late terminus at South Duxbury, Mass., southwest to the Old Colony's Plymouth line in Kingston. The South Shore and Duxbury & Cohassett roads now form a loop line 43 miles long, from the Old Colony's main line at Braintree to the Plymouth Branch at Kingston.

### Delaware, Lackawanna & Western.

The Binghamton (N. Y.) *Times* says: "The wages of the employes in the shops of the Delaware, Lackawanna & Western Railroad at Syracuse, Utica and this city have been cut down 10 per cent. We also understand that the same reduction has been done at Scranton and Great Bend. Several of the hands are being discharged at the former place."

### Salt Lake City & Coalville.

The capital stock of this newly incorporated Utah company is to be $1,000,000 and the incorporators are as follows: C. W. Schofield, New York; B. W. Morgan, Pennsylvania; Wm. B. Welles, Frank Fuller, H. C. Goodspeed, John W. Kerr, George M. Scott, Joab Lawrence, B. M. DuRell, M. Kirkpatrick, Warren Hussey, E. H. Barron, Hugh White, T. B. Jones, H. Wadworth and J. M. Burkett, Salt Lake City. Surveys have already been made of the line and a practicable route found. The distance from Salt Lake to Coalville is about 35 miles, and at the latter place connection is made with the Summit County road, a branch of the Union Pacific.

### North Carolina.

In the case of Swazy against this company, in which suit was brought to compel the sale of the State stock in the company, to pay interest on what are known as special-tax bonds, which were originally issued in aid of the road, the United States Circuit Court at Raleigh, N. C., has given its decision. The sale of the stock for the purpose named is ordered, but the Court postpones the day of sale until April 1, 1875, in order to give the State time to arrange for the payment of the interest in arrears.

### Meetings.

The following companies will hold their annual meetings at the times and places given:

Lake Shore & Tuscarawas Valley at the office in Cleveland, O., July 8, at 2 p. M.

North Carolina, at Hillsboro, N. C., July 9.

Central Pacific, at San Francisco, Cal., July 14.

California Pacific, at San Francisco, Cal., July 15.

Sacramento Valley, at San Francisco, Cal., July 15.

### Dividends.

Dividends have been declared by the following companies:

Rome, Watertown & Ogdensburg, 3½ per cent., semi-annual, payable July 15.

United New Jersey Railroad & Canal, 2½ per cent., quarterly, payable July 10.

Philadelphia & Trenton, 2½ per cent., quarterly, payable July 10.

Housatonic, 4 per cent., semi-annual on the preferred stock, payable July 25.

Wells, Fargo & Co. Express Company, 4 per cent., payable July 15.

### Pennsylvania—New York Division.

A part of the machinery from the Bordentown shops is being removed to the new shops on the Meadows, and a number of the men from Bordentown will also be employed there. Considerable repair work is being done at the new shops, in the finished buildings. Not much progress is being made on the freight-car repair shop, which is the principal building yet unfinished.

### Atlantic & Great Western.

English papers publish some clauses of the lease to the Erie Company. The rent to be paid is 28 per cent. of gross earnings for the first year, 29 per cent. the second year and 30 per cent. for the remaining 97 years of the term. The rental is payable monthly, the payment for each month to be made on the first day of the second succeeding month at such place as may be designated by the Atlantic & Great Western. All dues for labor and supplies owing by the Atlantic & Great Western at the commencement of the lease shall be paid by the Erie, and all supplies on hand shall be turned over to the Erie. No part of the equipment of the Atlantic & Great Western shall be used off its own road except as necessary in the exchange of through business. In all cases where equipment from one road shall be used on the other, mileage shall be allowed therefor and shall be adjusted in the monthly statement of accounts.

### Nashua & Rochester.

The grading and masonry is all completed, and the rails are being laid pretty rapidly. It is thought that the road can be opened for business by September next.

### Galveston, Harrisburg & San Antonio.

The track is laid to Waelder, Texas, 13 miles west of the late terminus at Flatonia and 132 miles from Harrisburg, the eastern terminus. The work is progressing steadily, and the track is expected to reach San Marcos, 30 miles west of Waelder and 58 miles from San Antonio, in July.

### Wilmington & Coast.

The directors of this company have resolved to contract immediately for the construction of a narrow-gauge line from Wilmington, N. C., northeast to the Sound.

### Atchison Bridge.

The directors have resolved to allow the sale of $1,200,000 bonds at 85. It is stated that an offer has been made at that price.

### Keokuk & Des Moines.

It is proposed to build a branch about two miles long from Oskaloosa Station, Ia., to the town of that name.

### St. Louis, Keosauqua & St. Paul.

The four miles from Summit Station on the Keokuk & Des Moines road to Keosauqua is graded and track will soon be laid.

### Harrisville.

A contract has been made with Mr. Benson, of Pittsburgh, Pa., who agrees to have twelve miles of the road, from Carthage, N. Y., east by north to Natural Bridge, completed this year, and the remaining 12 miles to Harrisville in another year. He is to have a lease of the road for 99 years from its completion. The road will open up a lumber district, besides some large iron ore deposits.

### Dayton & Union.

It is stated that the contest for the possession of this road has been closed by a compromise, and that it will hereafter be operated for joint account of the Cleveland, Columbus, Cincinnati & Indianapolis and Cincinnati, Hamilton & Dayton.

### St. Louis, Jerseyville & Springfield.

The books for stock subscriptions were opened June 11. The amount to be taken before commencing work on the line from Jerseyville, Ill., to Grafton is $500,000.

### Montpelier & Rutland.

This enterprise has been revived and the Commissioners were to meet June 23, at Rochester, Vt., to arrange for opening books for subscription to the capital stock of the company.

### Allegheny Valley.

At the meeting of creditors in Pittsburgh, June 16, President Scott submitted a statement showing the total floating debt to be $6,360,856.45. It is proposed to fund this floating debt in 7 per cent. bonds, secured by a mortgage or trust-deed. Col. Thomas A. Scott, who was present at the meeting, expressed his belief of the company's ability to pay 7 per cent. on its entire debt in three years. The report was referred to a committee of five, which committee afterwards made a report recommending the issue of gold bonds to cover the indebtedness, such bonds to be endorsed by the Pennsylvania Railroad Com-

pany. A permanent committee of five was appointed to confer with the officers of the company and also of the Pennsylvania Railroad Company.

### New York & New England.

An attempt is being made to raise by subscription among the stockholders the money necessary to pay off the trustees' liabilities and secure the transfer of the road to the new company. The subscription agreement provides that the money shall not be payable until the whole amount, $746,500, is subscribed. Subscribers will receive from the company an obligation to the amount of their subscription, which obligation bears 10 per cent interest and is payable in two years, or may be, if the holder desires, exchanged for the first-mortgage bonds to be issued hereafter.

### Toledo, Peoria & Warsaw.

The answer of the company to the complaint in the foreclosure suit has been filed. The default is admitted, but the company submits to the court the question whether it had under its charter and the laws of the State authority to make the consolidated mortgage and issue the bonds. A list of the floating debt and judgment creditors is appended and the Court is asked, in case a foreclosure and sale should be ordered, to provide for the payment of all creditors from the proceeds.

The trustees have submitted a report to the Court showing that from February 3 to June 15 their receipts had been $452,053.37, and disbursements, $441,483.88, leaving a balance of $10,569.49. Of the money paid out, $65,872.19 was on the payrolls of the company for December and January, before the trustees took possession.

### New York, New Haven & Hartford.

A determined attempt to wreck a passenger train was made near Greenwich, Conn., on the night of June 19. The place chosen was a covered wooden bridge about 75 feet long and 20 feet above the water, the bottom of the stream being rough and rocky, and the bridge being just at the end of a curve. The Springfield express leaving New York at 8:10 on that evening struck some rocks laying on the track on the bridge and threw them aside, doing no damage. A following freight found the track clear, but the Shore line express, an hour later, ran into some large rocks wedged down among the ties and seriously damaged the front of the engine, which was brought at once to a stand still, but did not leave the track. Both passenger trains were heavily loaded, and the first one carried an express car in which was a large number of money and other valuable packages. It was thought that the obstructions were put on by some tramps who were put off a freight train at that point earlier in the evening. Four men were arrested on suspicion.

The company has brought charges of fraud against Mr. Curtis Everett, its Superintendent of Docks in New Haven, and has put attachments upon his property, which is said to amount to $70,000.

### Grand Trunk.

Mr. C. J. Brydges, the late General Manager, in a speech made by him at a public dinner given him in Toronto, made the following very good statement of the peculiar disadvantages which this road has in competing for through traffic, disadvantages which seem not always to be recognized by the English proprietors:

"The Grand Trunk, he might say, would always have to contend with three great difficulties, tending to diminish its profits. One of these was that it ran outside the line of other companies, making its road to a certain point longer than theirs. There was a second difficulty—viz., a climatic one. It was the longest railway in the country, and had to contend with greater falls of snow than had any other. Its cost of working must consequently be greater in Winter than that of other lines with which it had to compete. The third and last great source of difficulty which it had to meet was the fact that it ran side by side with the most splendid and unrivalled system of water communication in the world. That was a fault owing to its geographical position, but its tendency was to reduce the profits derived from working the line by lowering its prices. These difficulties must always tend to make it a matter of extreme difficulty to meet the natural expectations of those persons who had spent their money in constructing the line."

The London *Railway News* of June 6 says, with regard to the new management:

"Mr. Hickson, the Treasurer and Secretary in Canada, is to take the place of Mr. Brydges as President of the Executive Council, but will not succeed that gentleman in the office of Managing Director in Canada, for Mr. Seargeant, who has been for some time past General Manager of the South Devon & Cornwall lines, will be the Vice-President of the Council, on which Mr. Hannaford, Mr. Spicer, Mr. Wallis and Mr. Stevenson, being the four principal departmental officers, will also have seats, as originally arranged. For the conduct of the business to be brought before the Council, it is arranged that Mr. Hickson is to have two votes, while Mr. Seargeant is to have one, thus always securing action on the part of the Council, subject, of course, to an active supervision on the part of the London board.

In reference to this arrangement, we have to congratulate the Grand Trunk proprietary on their good fortune in having secured the services of Mr. Seargeant, for, according to all we have heard of him, he is a man of great administrative ability. He has, in his relation to the South Devon, exhibited a considerable amount of parliamentary and diplomatic skill and tenacity of purpose, both useful qualifications in one who has to take charge of Grand Trunk interests in Canada. We understand that Mr. Seargeant is to sail for Canada on the 1st of August, and that the President will personally introduce him to those with whom he will have to co-operate in the local management of the company's affairs."

### Wisconsin Valley.

A letter from Mr. James F. Joy to Mr. F. O. Wyatt, Chief Engineer of this road, recently published, says that all his efforts in New York and Boston to obtain money for the extension of this road this season to Wausau have failed. Mr. Joy explains this disinclination to invest in the road as follows:

"Since I saw you and authorized you to say that we would extend the road beyond Knowlton, the act of the Legislature of Wisconsin regulating the rates and fares at which business may be done on the railroads of that State has been published and become known to the world. The effect has been such as to render it almost, if not quite impossible to induce capitalists to put money into that kind of property in the State at present, and it may in consequence be wholly out of our power to accomplish the extension. I find all capitalists discouraged and almost hopeless as to the future of railroads in your State. They seem even to prefer to totally lose all they have invested there rather than make the effort to save it by aiding the necessary improvements and extensions requisite to give value to existing property."

### New York & Canada.

A correspondent informs us that the grading on this road from Whitehall to Port Henry, N. Y., is completed. John O'Brien, the contractor, has a very large force of men at work between the latter place and Pittsburgh. This road is being built by means furnished by the Delaware & Hudson Canal Company, which already controls a continuous line of railroad between Whitehall, its southern terminus, and the coal fields of Pennsylvania. Several of the prominent stockholders in the Delaware & Hudson Canal Company have made extensive purchases of mineral lands along the line and have erected large furnaces at Crown Point for the manufacture of iron.

### St Louis & Southeastern.

This company has made a proposition to the city of Evansville, Ind., to the effect that if the city will subscribe to the stock of the company a tax of 1 per cent. on its valuation and give 20 acres of suitable land, the company will build on that land and will also build a track down the river from a point in Kentucky, opposite Evansville, to Henderson.

It is said that the Mt. Vernon shops will not be rebuilt, but that new shops will be located at Belleville, Ill.

### Easton & Amboy.

Tracklaying is progressing from Bound Brook, N. J., eastward toward New Market, though the tracklayers are delayed somewhat by unfinished bridges. The eastern section, from Bound Brook to Perth Amboy, will be finished by August 1. The road is being built in a very substantial manner. The Keystone Bridge Company is putting up all the bridges.

### Portland & Ogdensburg—Vermont Division.

A small force is kept at work on the grading between Hyde Park, Vt., and Swanton, and 30 miles out of the 38 are graded and ready for the rails.

### Philadelphia, Wilmington & Baltimore.

The new iron span of the Susquehanna Bridge at Havre de Grace, Md., has been completed. The span is 255 feet long and was built by the Baltimore Bridge Company. The other spans of this bridge are to be gradually replaced by iron hereafter.

### Geneva & Ithaca.

London papers of June 6 have an advertisement offering an issue of $800,000 of this company's 7 per cent. first mortgage gold bonds, guaranteed by the Geneva, Ithaca & Athens Company, at 87½. This issue is at the rate of $20,000 per mile on the line from Geneva to Ithaca. The Ithaca & Athens with which it is consolidated, earned net in the year ending with September last nearly $50,000 more than enough to pay the interest on this and the old debt of the consolidated company.

### New York & Oswego Midland.

A meeting of bondholders was held in New York, June 19, to receive a report from the committee previously appointed. Two reports were presented, one by Messrs. Meier, Drier and Perkins, which praised the management of the receivers and recommended their continuance in possession until the company could be completely reorganized. The report discusses the question of the legality of the issue of receivers' certificates, and considers that their issue has been of benefit to the bondholders, as putting out of the way many claims which needed immediate settlement. A formal recognition of the certificates by the bondholders is recommended. The policy of retaining certain leased lines is approved, as they have brought much traffic to the main line. The report adds that in conference with the committee of second-mortgage bondholders the belief was expressed that the junior interests should not be required to contribute as large a percentage of cash in the reorganization as the first mortgage, as their prospect of benefit was more remote.

A minority report, presented by W. A. Stevens, assailed the management of the receivers and the issue of certificates, and recommended that the road should be put in the hands of a practical railroad man. It was also recommended that the bondholders present should form a convention, prepare a plan of reorganization, and appoint a committee to buy in the road at foreclosure sale.

After an animated discussion a resolution was passed to appoint a committee to report to a future meeting a plan of reorganization which shall protect the interests of the creditors. The members of that committee are: L. H. Meier, New York, Chairman; C. L. Perkins, M. Drier, New York; A. D. Mather, Utica, N. Y.; J. N. Clarke, Oxford, N. Y.; H. Wheeler, Philadelphia; Newton Chase, Hartford, Conn. The committee has power to fill vacancies.

### Northern Pacific—Pacific Division.

The repair shops, which have heretofore been at Kalama, W. T., the Columbia River terminus, are to be removed to Tacoma, the Puget Sound terminus.

### Joliet & Northwestern.

Three lines have been surveyed from Aurora to Joliet, and the right of way is being negotiated for. It is thought the middle line, through Plainfield, will be adopted.

### Poughkeepsie & Eastern.

In a suit against this company Judge Barnard, of the New York Supreme Court, has appointed Jacob B. Carpenter Receiver.

### Martha's Vineyard.

The grading on this line is more than half done and it is intended to have the road completed in July. It is a narrow-gauge road, running across the island of Martha's Vineyard from Katama to Oak Bluffs, and is about 12 miles long. It will be chiefly a summer road.

## Contributions.

### Railroad Companies' Reports and Statistics.

To the Editor of the Railroad Gazette:

Railroad companies, in their published reports, usually give certain statistics, formulated "per mile operated," "per train mile," "per ton transported," etc. The *use* of these tables, which are constructed at considerable cost, does not very clearly appear.

The purposes for which statistics are required after ascertaining gross earnings and expenses are:

1*st*. To ascertain the amount and nature of business done during the year, upon which to base an estimate of the prospects of the coming year and to compare the business of different years.

2*d*. To ascertain whether the road has been operated economically.

3*d*. To ascertain whether the charges for transportation can be reduced or must be raised.

To ascertain the amount and nature of the business done, simple addition by the brains of an ordinary clerk suffices; but when it is desired to investigate the character of the management or the reasonableness of transportation charges, very great difficulty is experienced for want of a standard of comparison. It is so easy to measure our track by the mile, our coal by the ton, our oil by the gallon, that the desire to find some equally facile means of gauging the operations of railroad companies has led railroad economists into the maze of "train-miles," "tons-lifted," "tons-hauled-one-mile," etc., all of which formulæ have some use, but not one of which, taken by itself, gives reliable information as to the operations of a railroad. For instance, taking the train mile as the standard, we find that the Massachusetts road varied 60 per cent. in the cost of running their trains. The Boston & Providence, a wealthy, well-managed corporation with a business skillfully and economically conducted, returns $1.70 per train-mile as the cost of its operation. The Eastern, which is yet suffering from the effects of former ill-management, and which by reason of active competition is compelled to adopt a liberal policy and a more expensive system of operation, returns the cost of its business at $1.06 per train mile, or 37 per cent. less than that of its antipode, the Boston & Providence. We can understand why this appears so; but it is also easy to conceive how, when such standards are set up by railroad economists, the impractical members of the community have concluded that there should be a uniform charge per ton per mile. Indeed it is not to be wondered at that "the People," after perusing the masses of figures given in railroad companies' reports and in railroad commissioners' volumes, should, in despair, come to the conclusion that the whole thing is a fraud, that railroad companies make enormous profits and endeavor to hide their tracks.

Mr. O. Chanute, in his very able paper read before the American Society of Civil Engineers in February last, has clearly demonstrated the intricate and complicated nature of the work to be done, the utter valuelessness of the methods by which it has been hitherto attempted to compare the working of different roads, and the fact that "so complicated does the subject become, upon even a slight examination, that railway managers are very loth to commit themselves to positive statements as to the cost of particular portions of their traffic; and much of the reticence which has been so sharply criticised during the discussion which has been going on in the public prints on this subject is no doubt due more to the unwillingness to put themselves on record concerning points which are by no means clear even to themselves, rather than to any disinclination to enlighten the public."

The able writer has clearly shown the uselessness of the "train-mile," "ton-lifted" formulæ, except as integral parts of a standard of comparison for different roads, yet has suggested no method of comparison. Fools rush in where angels fear to tread; nevertheless, when so able and experienced a man as the author of the paper referred to confesses himself unable to solve the problem, some of us who are comparatively tyros, with a fame not so bright as to be easily tarnished, may attempt, even though we do so but to fail.

In the expenditure of railroad companies we find there are two classes, one independent of, the other in direct proportion to, the volume of business done; yet it is almost impossible to separate them and to estimate accurately the value of each. Mr. Chanute has divided the elements of cost into:

I. Roadway Charges (including taxes), independent either of the volume or character of the traffic.

II. General Expenses, varying somewhat in proportion to the volume of trade obtained, as well as with the length of road, but apparently independent of the distance the traffic is to be carried.

III. Station Service, varying nearly in proportion to the tonnage handled, but independent of the distance it may have to be carried.

IV. Track Repairs, varying with, but not in direct ratio to, the tonnage transported and speed of trains, affected by construction, equipments and peculiarities of soil and climate.

V. Car Service, varies with car mileage, but affected by detentions.

VI. Train Service, varying with tonnage and distance transported, affected by character of the line.

VII. Insurance, dependent upon value or perishable nature of goods carried.

Having made this division, the writer seeks to find a standard of measurement for each and so compares roadway charges by the ton per mile, general expense by the ton lifted, station service and train service by the tons carried one mile, track repairs by the train mile; but for car service and insurance no definite standard can be used. As the writer says, the various expenses included in these divisions are so combined with each other in so many different operations that it is very difficult to separate them. We find in each division certain constant expenses independent of the quantity of traffic, and the great difficulty is to separate these constant expenses from the variable ones, which are in direct proportion to the volume of business. It is evident that the same standard applied to the constant and to the variable expenses will give results of no value for comparison; it should therefore be our aim to separate the two kinds as much as possible and apply a different standard to each.

I would suggest a division of elements of cost as follows:

I. Management.—Including *all* expenses of the general office and establishment and the Superintendent's offices and establishments.

II. Up-keep of Permanent Fixtures.—Repairs of earth works, masonry, permanent way, buildings, track repairs, fences, etc.

III. Insurance.—On buildings, stock, etc.

IV. Taxes.

V. Law Expenses.—Including all law expenses except those of the loss and damage department.

VI. Construction Account.—All new rolling stock, additional buildings, improvement of structures to adapt them to increased business, additional sidings, etc.

VII. Cost of Obtaining Business.—All outside offices, agencies, commissions, advertising, etc.

VIII. Loss and Damage.—All claims paid for damage to person and property, and the law expenses of this department.

IX. Cost of Transportation.—Station offices and establishments, train services, all expenses of locomotive department and of telegraph department, repairs of rolling stock.

Taking the first division—Management—we find that these expenses depend in a very slight measure on the business